SUPPORT MATERIALS

GENERAL CONSTRUCTION TRAINING PACKAGE BCG98

LEARNING MATERIALS

BCG1003A: READ AND INTERPRET PLANS

ACKNOWLEDGMENTS:

This project acknowledges the learning resources developed for the National Transition Project ’96 – ’97 as the source for the development of these learning materials.

COMPILED BY:
Construction Training Queensland in partnership with Construction Curriculum Consortium, TAFE Queensland.

This resource was developed as part of the Support Materials for the Building and Construction National Training Packages.

This project was managed by Construction Training Queensland in partnership with the Construction Curriculum Consortium, TAFE Queensland.

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PLEASE NOTE

These materials have been adapted from learning resources developed for the National Transition Project by the Yeronga Institute of TAFE in Queensland in 1996/97.

Since the National Transition Project materials were produced Construction Training Australia developed a new version of the competency standards to be included in the Training Packages. Therefore, the National Transition Project materials may not fully cover all of the competency standards.

Instructors should use other appropriate learning resources to enable competency standards to be addressed against **ALL** elements and performance criteria within the range of variables specified.

1.1	2.1	3.1	4.1	5.1*	6.1
1.2	2.2	3.2	4.2		6.2
1.3		3.3			
		3.4			

* Partially addressed

TABLE OF CONTENTS

INTRODUCTION

This learning package is intended for use by those completing the Competency Unit **BCG1003A – Read and Interpret Plans** as part of *BASIC INDUSTRY SKILLS* within the *GENERAL CONSTRUCTION SKILL STREAM OR OFFSITE STREAM* of the *National Construction Industry Competency Framework.*

The theoretical and practical components in this package will help you complete the competency unit. All set tasks, including the activities and demonstrations, will show how the theory or content can be applied in on-site, simulated on-site or off-site conditions.

The competency unit **Read and Interpret Plans** deals with the knowledge and skills required to calculate materials and set out correct tiling procedures for public pools and spas and so includes specific details on:

- Introduction to plan and specifications reading;
- Plans and specifications;
- Building structure types.

Two **Assessment Tasks** meet the requirements of the **elements** in this competency unit:

Assessment Task 1

- Recognise and describe a variety of construction drawings, plans and supporting documentation.
- Identify and communicate information from plans and specifications.
- Read a variety of information from a range of construction drawings and complete (freehand) working sketches.

Assessment Task 2

- Identify and describe a variety of construction details relating to commercial and domestic structures.

The learning package has been developed within sequential sections each closely aligned to the assessment tasks.

SECTION 1: This contains learning resource material and self-checks required for the successful completion of the Assessment Criteria as shown in the Assessment Specifications for Task 1 and 2.

SECTION 2: In a similar manner, this section contains the information as well as practical work that will help you successfully complete Task 2.

As well as self-check exercises and practical activities, your instructor will schedule additional oral and/or written tests, which may be similar to the self-check exercises. These tests will satisfy specific Assessment Criteria in the Assessment Tasks and will apply to your work environment.

When you have achieved all the Assessment Criteria in Assessment Tasks 1 and 2 and your work has been checked and certified by your instructor, you will have successfully completed the elements which make up the competency unit **BCG1003A – Read and Interpret Plans.**

WHAT IS PROVIDED

The learner will be provided with the essentials to successfully complete this module, including:

- a learning package;
- sets of relevant plans and specifications;
- drawing board and T square;
- access to various building types for identification; and
- drawings, photos and/or slides of building structures.

WHAT YOU PROVIDE

- Appropriate personal protective clothing etc – to be advised by the instructor.
- Basic drawing equipment, for example, pencils; scale rulers, AS1212 – 2/300, 45° and 60° / 30° set squares; and calculator.

WHAT YOUR INSTRUCTOR WILL PROVIDE

Your instructor will provide the necessary information that relate to your trade area.

The information in this learning resource applies to on-site and off-site trades. Although the examples given may not always directly apply to your workplace, your instructor will give you more detailed demonstrations and relevant activities to complete as required.

HOW TO USE THIS PACKAGE

This package has been designed so that you can work and learn at your own pace, incorporating into your own learning program.

- demonstrations of practical skills by your instructor or experienced tradesperson;
- planned and supervised practical application of your knowledge and skills;
- instruction in, and application of, safe working practices; and
- personal progress indicators through self-check exercises and practical activities.

It is suggested that you work through the two sections as they are presented.

By all means, *fast-track* any aspects/areas where you feel confident.

Self-Check Exercises have been included so that you can measure your own progress. These exercises, however, are not part of the formal assessment of competency.

GETTING TO "KNOW THE PACKAGE"

Here is a strategy, which may help the learner become familiar with the contents of this package.

Survey

- Scan the whole package
- Read the *contents* page and the *introduction*, then flip through the pages - glance at the headings.
- Notice that there are set *tasks* to be completed. The *content* relates to these tasks.

Ask

- Ask about any *topics*, *terms* or *details* that are not clear to you at this stage.

Read

- Read through the material, but do it *actively*. *Jot* down points, *underline* or *highlight*.
- *Link* the information with what you know already.
- Let the *headings* and *sub-headings* help you organise information.
- Remember *that you will need the content to complete the tasks.*

Review

- At various stages, you will be directed to review the main points or complete a *Self-Check Exercise* to indicate how you are progressing.
- Make your own *notes* as well.

Instructor

Throughout this package, you will be required to attend practical *demonstrations* and receive instruction in the use of materials, tools and equipment.

Ask your instructor if you have any *problems* with:

- interpretation of content;
- procedures or processes; or
- availability of resources

KEY TO SYMBOLS

Symbols are placed in the left hand margin to draw attention to the type of information commencing at that point.

The symbols used in this package are:

READ	*This is the essential information for the module.*
DEMONSTRATION	*At times, your instructor will give practical advice and demonstrate the use of tool/equipment.*
SELF-CHECK	*These are your progress indicators. Typical answers are also included.*
PRACTICAL ACTIVITY	*The activities allow for the application of the theory components.*
SITE VISIT	*Your instructor will schedule visits to appropriate sites, when appropriate.*

SUMMARY OF TRAINING SPECIFICATIONS

Unit Number and Title	**BCG1003A – Read and Interpret Plans**
Pre-Requisites	Concurrent assessment and pre-requisite relationship are nil.
Elements of Competency	• Identify Types of Drawings and Their Functions • Recognise Commonly Used Symbols and Abbreviations • Locate and Identify Key Features on a Site Plan • Identify and Locate Key Features from Sectional Details and Elevations • Recognise Amendments • Read and Interpret Specifications
Delivery	Delivery methods must provide for the demonstration of competence in skills specified in all learning outcomes, either in on-site, simulated on-site or off-site conditions.
Resource Implications	• Materials selected and identified appropriate to the tasks • Tools, plant and equipment • Suitable workplace location/simulated workplace environment • Appropriate communication of documentation relative to the tasks Desired training qualifications and training required for those involved in the instructional process are: • Possess competency and knowledge relevant to the competency standard at a level equivalent to or higher than the competency under assessment; • Possess a level of specific and relevant quality industry experience in order relate competency to current industry practice; • Provide evidence of having successfully completed or being assessed competent in a relevant course of instructional skills; or • Provide formal evidence of successfully completing the requirements of an established process for Recognition of Prior Learning (RPL) or Recognition or Current Competencies (RCC) equivalent to the required competencies and knowledge of instructional skills.

TRAINING SPECIFICATIONS

Unit Number and Title	**BCG1003A – Read and Interpret Plans**
Element of Competency	**Performance Criteria**
Identify Types of Drawings and Their Functions	• Main types of plans and drawings used in the construction industry identified; • Key functions of each type of drawing identified; • Key users of these drawings identified.
Recognise Commonly Used Symbols and Abbreviations	• Commonly used symbols and abbreviations recognised; • Function of the legend understood and explained.
Locate and Identify Key Features on a Site Plan	• Key features and dimensions of site identified and located; • Orientation of site identified; • Access from roadways to job-site located and identified; • Services identified.
Identify and Locate Key Features from Sectional Details and Elevations	• Specific key features identified correctly from sectional details and elevations; • Structural features and horizontal and vertical measurements located.
Recognise Amendments	• Title panel checked. Verify that drawing used is the latest amendment.
Read and Interpret Specifications	• Purpose of specifications identified.

Key Competencies

	Level
Collecting, analysing and organising ideas & information	1
Communicating ideas and information	1
Planning and organising activities	1
Working with others and in teams	1
Solving problems	1
Using mathematical ideas and techniques	1
Using technology	1

ASSESSMENT SPECIFICATIONS

Unit Number and Title	**BCG1003A – Read and Interpret Plans**
Guidelines for the Assessor	This is a supervised assessment requiring observation of the process with individual final assessment tasks. Forms of assessment to be considered by the assessor are as follows: • Written/oral tests • Observation; • Demonstrations; • Practical tasks and/or projects. Assessment may also be demonstrated through other forms of assessment not included in the above methodology including: • Simulation of real-life work activity; • Individual projects; • Portfolio; • Recognition of Prior Learning/Recognition of Current Competencies
Method and Context of Assessment	Competence should be assessed under guidance checking at various stages of the process and at the completion of task/activity against the elements and performance criteria specified in the standard. Competency may be assessed in the workplace or simulated workplace setting.
Human Resource Implications	Desired assessor qualifications and training required to assess would be as follows: • Possess competency and knowledge relevant to the competency standard at a level equivalent to or higher than the competency under assessment; • Having completed a course in instruction for registration as an assessor with CTA or be accredited as a Registered Training Organisation (RTO) for assessor services; • Possess a level of specific and relevant quantity industry experience in order to relate competency to current industry practice.

Training qualifications required:

- Possess competency and knowledge relevant to the competency standard at a level equivalent to or higher than the competency to be achieved.
- Having completed a course or being assessed competent in a course of instructional/assessment skills.
- Possess a level of specific and relevant quality industry experience in order to relate competency to current industry practice.

Physical Resource Implications

The following resources should be made available:

- Suitable range of drawings and specifications

Range of Variables

Types of drawings include:

- site plans
- elevations
- floor plans
- sectional plans/elevations
- detailed and specification providing illustrations and dimensions

Key features of site plans may involve:

- shape of site
- proposed building/s
- roads
- easements
- existing buildings/structures
- services
- dimensions

Key features of plans and elevations may involve:

- type of structure – structural members
- shape of building/structure
- type of construction
- layout of rooms
- service requirements
- location of plant or machinery
- vertical and horizontal measurements

Types of structures include:

- single storey buildings
- double storey buildings
- multi storey buildings
- bridges
- fabricated towers

Types of construction include but are not limited to:

- structural steel framed
- light steel framed
- timber framed
- reinforced concrete
- pre-cast concrete
- solid brick
- brick veneer

Services may include:

- drainage
- sewerage
- gas
- water
- electricity

Types of details include but are not limited to:

- structural steelwork
- timber framework
- brickwork
- concrete work
- plastering

Orientation of site includes:

- relationship to 'North'
- location of roads
- relationship to roads and neighbouring sites

Evidence Guide

Competency is to be demonstrated by the performance of effectively reading and interpreting drawings to locate or identify nominated drawings, features or functions in accordance with the performance criteria and the range listed within the range statement.

Critical Aspects and Evidence

It is essential that competence is observed in the following aspects:

- Demonstrate an identification and understanding of various types of drawings
- Identification of dimensions, symbols, abbreviations and key features
- Identification of title panel and reference date as to up to date copy of drawings
- Indicate a sound understanding of the purpose of specifications in accordance with the work orientation.

Pre-requisite Relationship of Units

Nil

Underpinning Knowledge

A knowledge of:

- A range of drawings
- Materials relative to drawings/specifications
- Measurements and calculations
- Symbols, dimensions and terminology

Skills

The ability to:

- Read and interpret drawings
- Measure accurately
- Communicate effectively

INTEGRATED PROJECT-BASED TRAINING

It should be noted that all training in this program is project-based.

The training must integrate all competencies including the use of tools and equipment.

The knowledge and skills you gained in this program regarding good communication, quality concepts and OH&S must be practiced again in all competencies.

CHECK LIST FOR ASSESSMENT RESOURCES

Title	Identifies the title of the learning resource that related to the standard being assessed.
Unit (s) of Competence	Identifies conditions under which assessment can be conducted based on information from 'range of variables statements' and 'evidence guides' in competency standards.
Instructions for Assessors	Informs the assessor about the scope of the assessment resource ie. the assessment methods to be used and the conditions of assessment as well as the procedure to follow in preparing, conducting and reviewing the assessment.
Direct Observation Checklist	Checklist for outcomes of observations of performance and other forms of evidence eg. Responses to questions, related directly to 'performance criteria' and 'evidence guides' in competency standards. (Refer assessment specification in Learning Materials for each competency standard.)
Other Evidence Gathering Methods	Instructions for assessors on methods of gathering indirect and supplementary forms of evidence. This may include assessor guidelines and/or outlines of assessment tasks for: • Products or services produced by assessee; • Third party reports; • Individual/group projects; • Written tests; • Portfolios; • Structured oral questioning; and • Test banks.
Record of Assessment Outcomes	Identifies way in which outcomes of different evidence gathering techniques, incorporated in assessment resource, are recorded.
Reference Documentation	Identifies reference material required to support specific evidence gathering techniques. This may include: • Organisational policies and procedures; • Manufacturer's instructions; • Safety regulations; • Product information; and • Legislation.
Assessor Note	Assessors may find it useful in creating a checklist to refer to the non-endorsable learning resource materials access list for the appropriate learning resource packages.

ASSESSMENT TASKS

ASSESSMENT TASK 1

- Recognise and describe a variety of construction drawings, plans and supporting documents.
- Identify and communicate information from plans and specifications.
- Read a variety of information from a range of construction drawings and complete (freehand) working details.

The above procedures could be carried out in one or more projects.

Assessment Task 1 incorporates:

- Basic Measuring and Calculations
- Quantities

Item	Assessment Criteria	Achieved
1	Identifies and names a minimum of six (6) different types of plans used in construction drawings.	❑
2	Identifies 8 out of 10 common symbols used to represent fixtures and building services.	❑
3	Demonstrates an ability to sketch accurate freehand drawings to approximate scale from nominated parts of given construction drawings.	❑
4	Demonstrates an ability to use dimensioning techniques and drawing scales.	❑

* Items 1 and 2 **must** be performed fully.

* Items 3 and 4 **must** be performed fully and to the satisfaction of the Assessor.

Section Overview

Section 1: Interpretation of Plans

BCG1003A: Read and Interpret Plans

In this section you will find learning resources support the underpinning knowledge and skills relating to:

Competency BCG1003A, elements 1, 2, 3, 4, 5 and 6:

1. Identify Types of Drawings and Their Functions
2. Recognise Commonly Used Symbols and Abbreviations
3. Locate and Identify Key Features on a Site Plan
4. Identify and Locate Key Features
5. Recognise Amendments
6. Read and Interpret Specifications

SECTION 1 INTERPRETATION OF PLANS

READ

INTRODUCTION

This first section of this package deals with four main aspects:

- working drawings
- plans
- plan and document reading
- job instructions
- job instructions

These four areas include the essential information you will need to complete Assessment Task 1 which addresses the Learning Outcomes NBC 1004.1, 2 and 3;

- Recognise and describe a variety of construction drawings, plans and supporting documentation.
- Identify and communicate information from plans and specifications needed for day-to-day requirements.
- Read a variety of information from a range of construction drawings and complete working sketches.

The information presented in this section will provide you with a basic knowledge of:

- site plans and drawings.
- the day to day requirements documented in plans and specifications.
- the use of construction drawings and sketches.
- the importance of job instructions.

WORKING DRAWINGS

Working drawings enable estimators, builders and sub-contract trades persons to perform their respective tasks.

Most working drawings have a standard layout of plans, elevations and detail sections. If you need to reach information from plans, this standard layout will help you find it.

A set of drawings for the construction of a building consists of some or all of the following:

- Site Plan
- Foundation Plan
- Floor Plan
- Elevations (four)
- Sectional Elevation
- Section Details
- Bracing Plan
- Tie Down/Fixings
- Joinery Schedule
- Timber List

Most of these relate to on-site construction plans, in off-site some plans will apply. The importance of job instructions in off-site construction workplace, such as a factory, will be discussed towards the end of this section.

General requirements for working plans are that they be drawn to a scale of 1:100 except construction details, which are required to be drawn to a minimum scale of 1:20 and site plans to a scale of 1:500. However, 1:200 is preferred by many Local Authorities. The scale may also depend on the area of the site.

Figures 1 - 5 show a sample set of working drawings for the construction of a brick veneer dwelling and *Figures 6 - 8* are the working drawings for a concrete block garage.

Off-site trades people, like construction workers, must be able to read and interpret plans without error. Often this could be the only method by which you will be able to calculate the size of the products you are going to produce and the materials you will need.

An example may be the manufacture of stairs or joinery for domestic or commercial buildings.

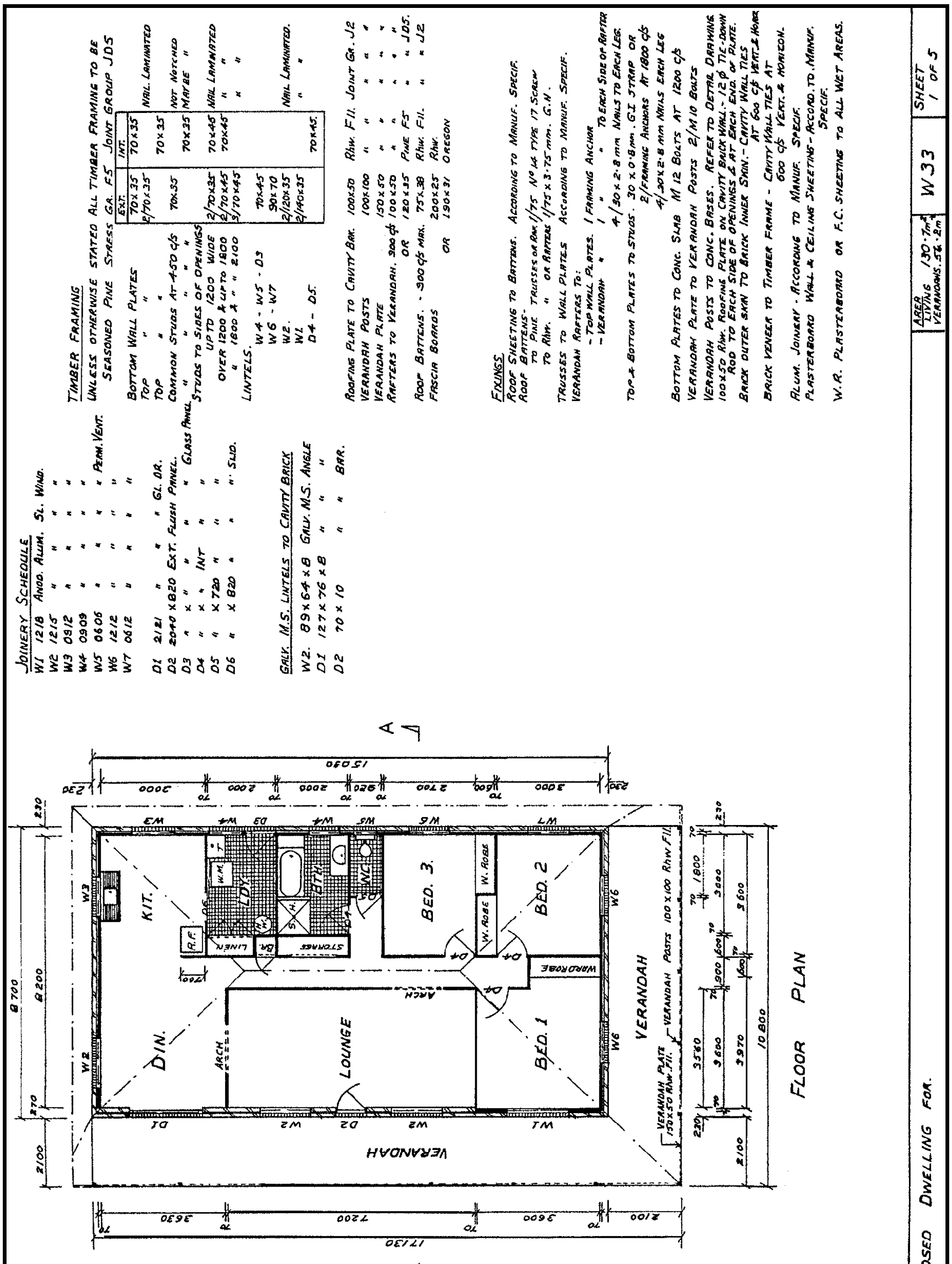


Figure 1: Brick Veneer Dwelling – Floor Plan

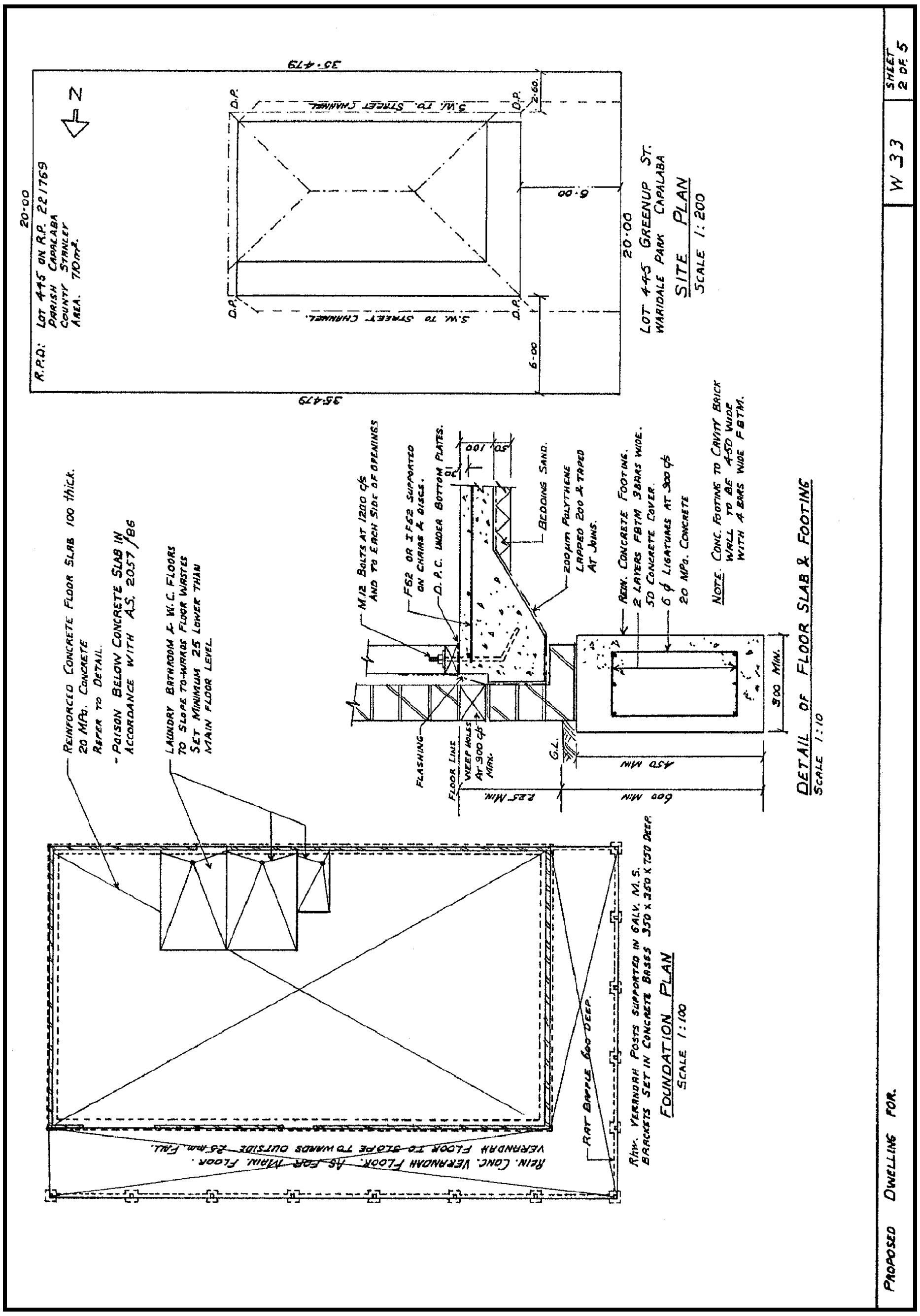


Figure 2: Brick Veneer Dwelling Site and Foundation Plans

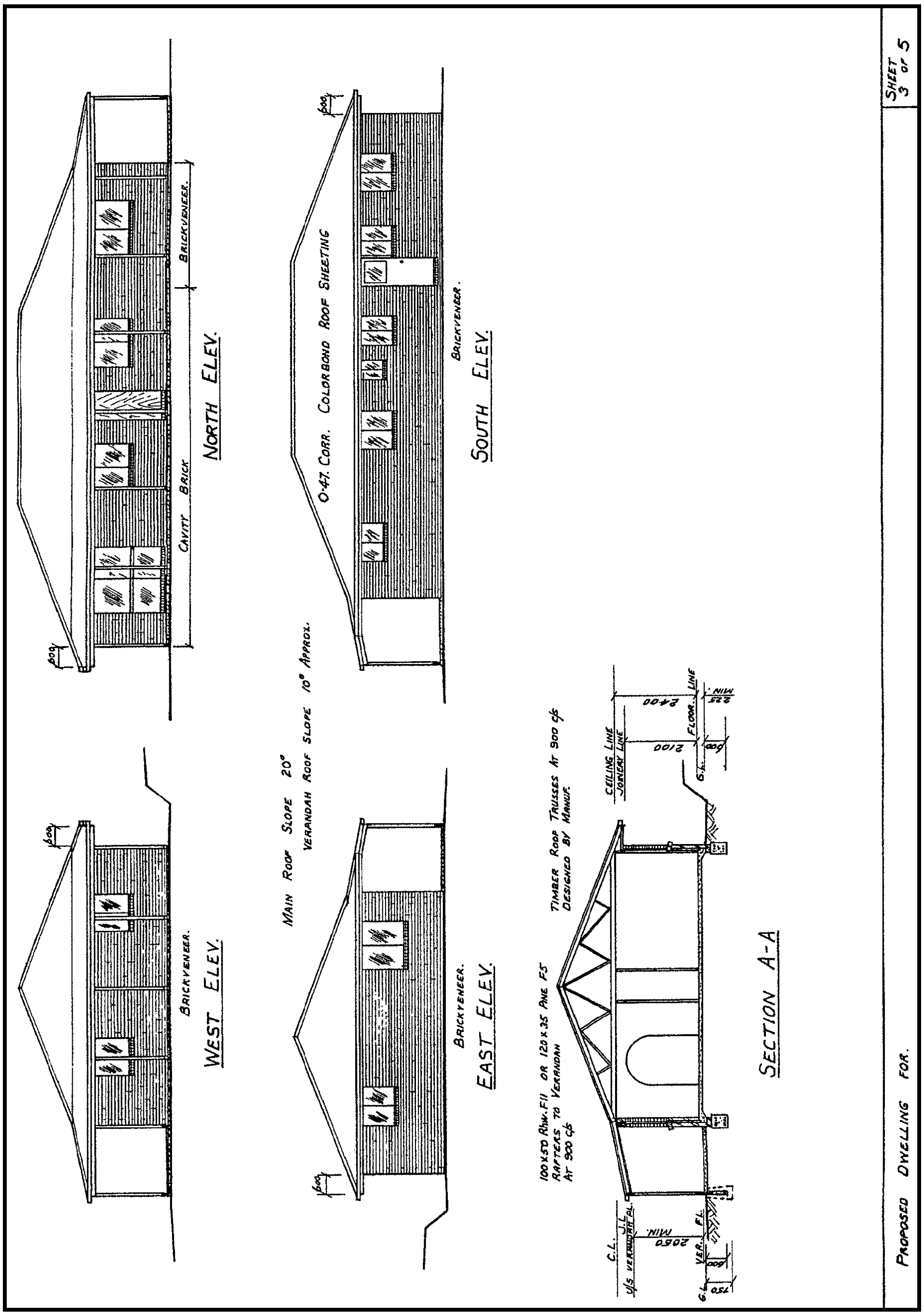


Figure 3: Brick Veneer Dwelling – Elevations and Sections

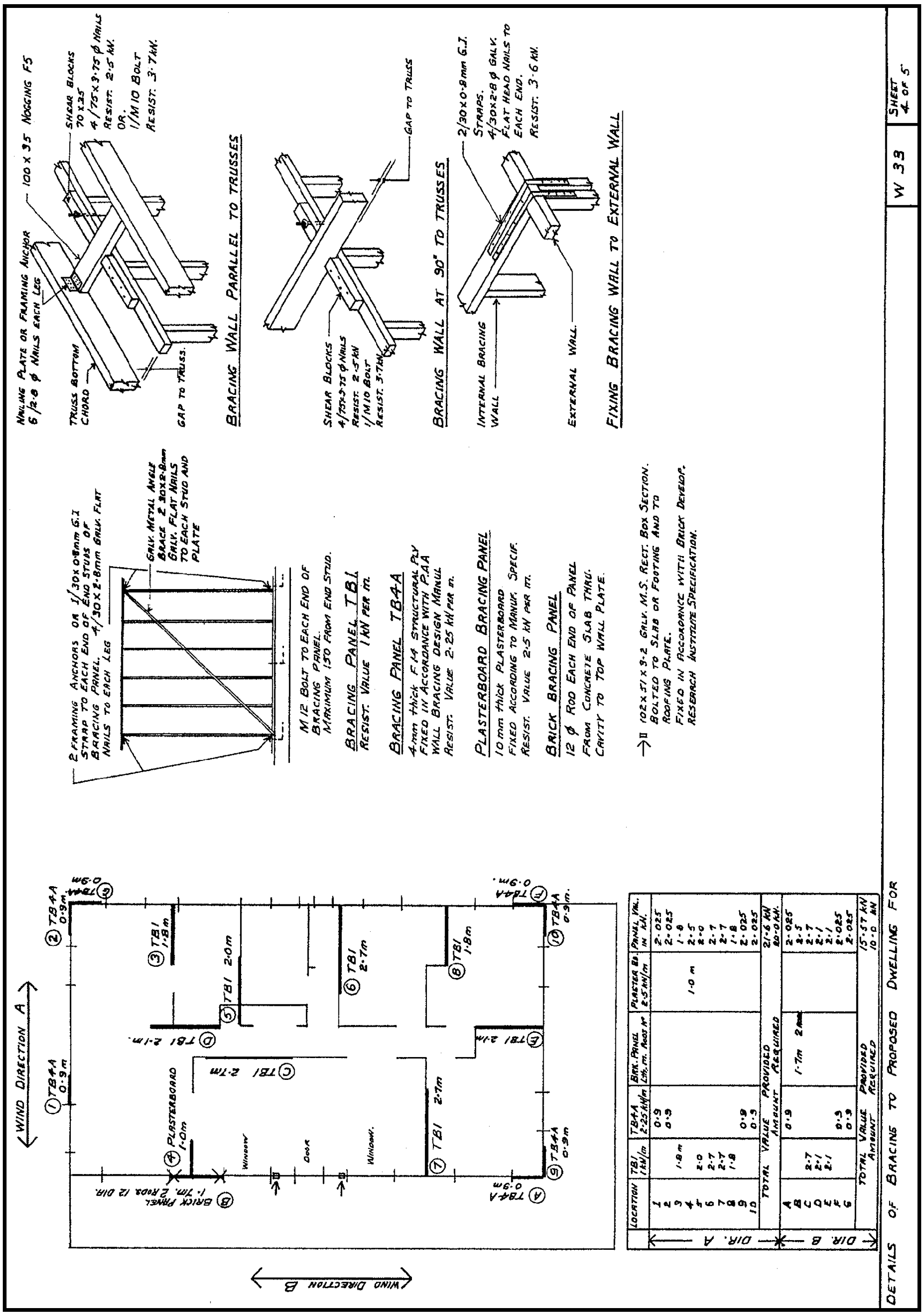


Figure 4: Brick Veneer Dwelling – Bracing Details

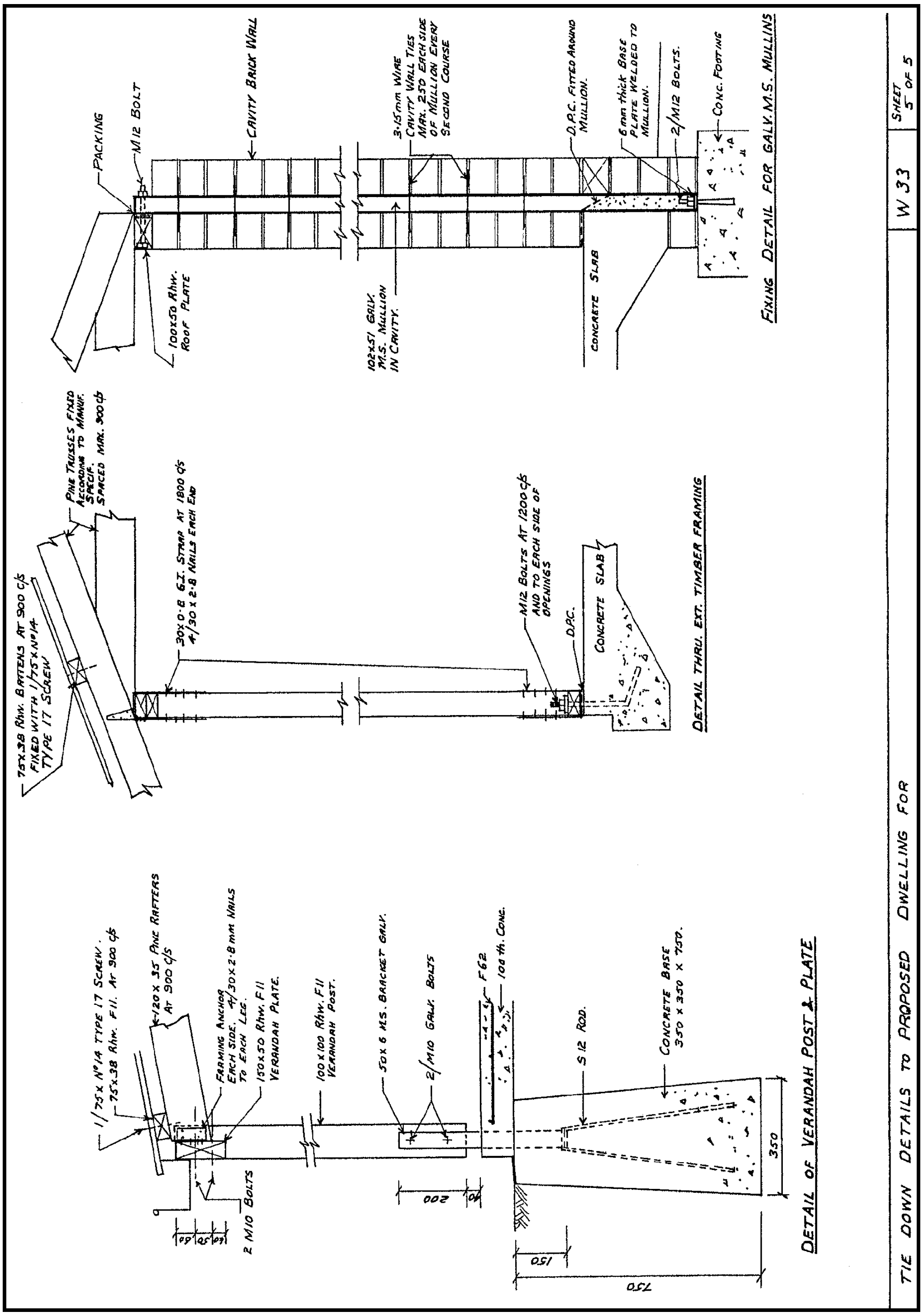


Figure 5: Brick Veneer Dwelling – Tie Down Details

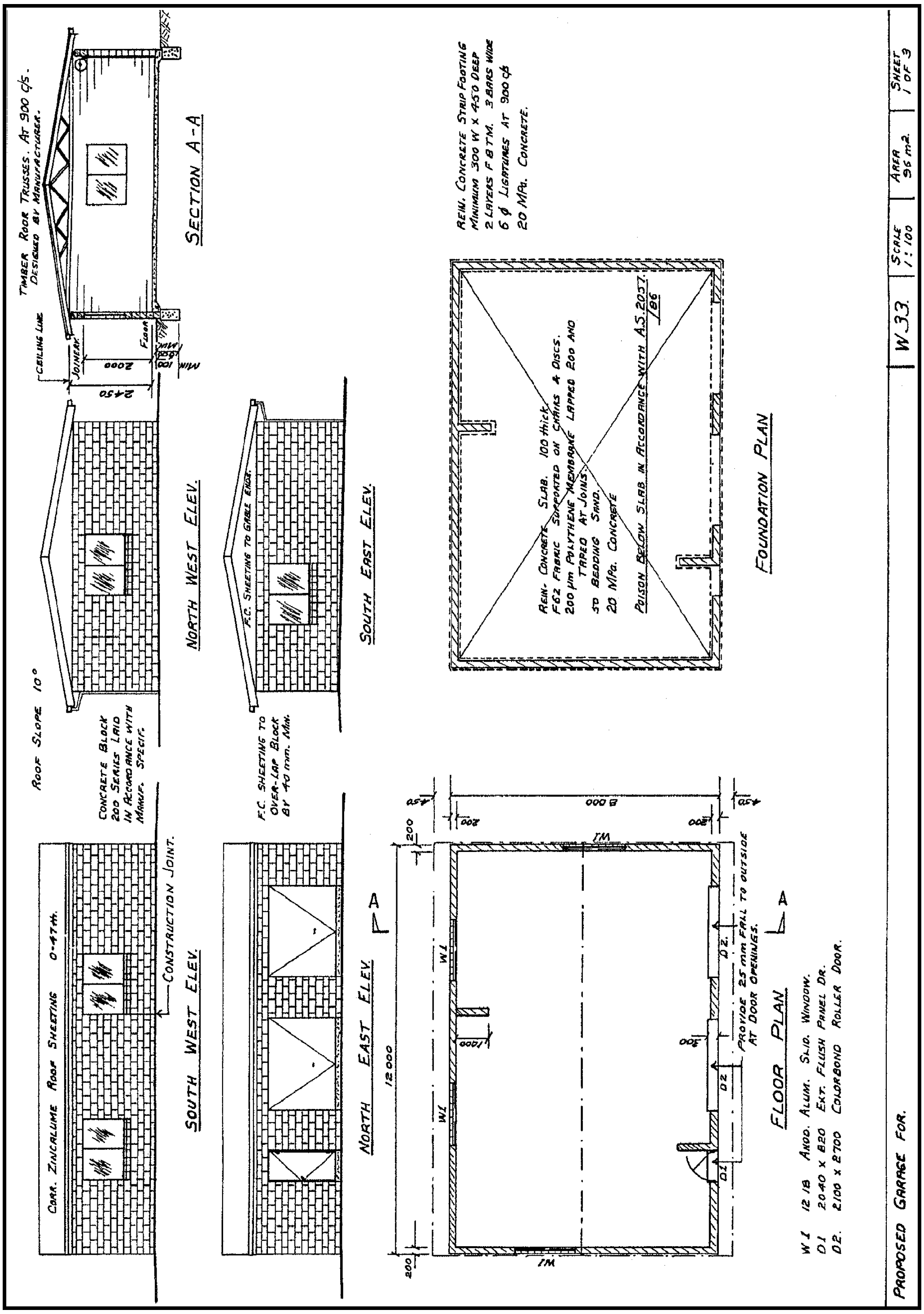


Figure 6: Concrete Block Garage – Plans and Elevations

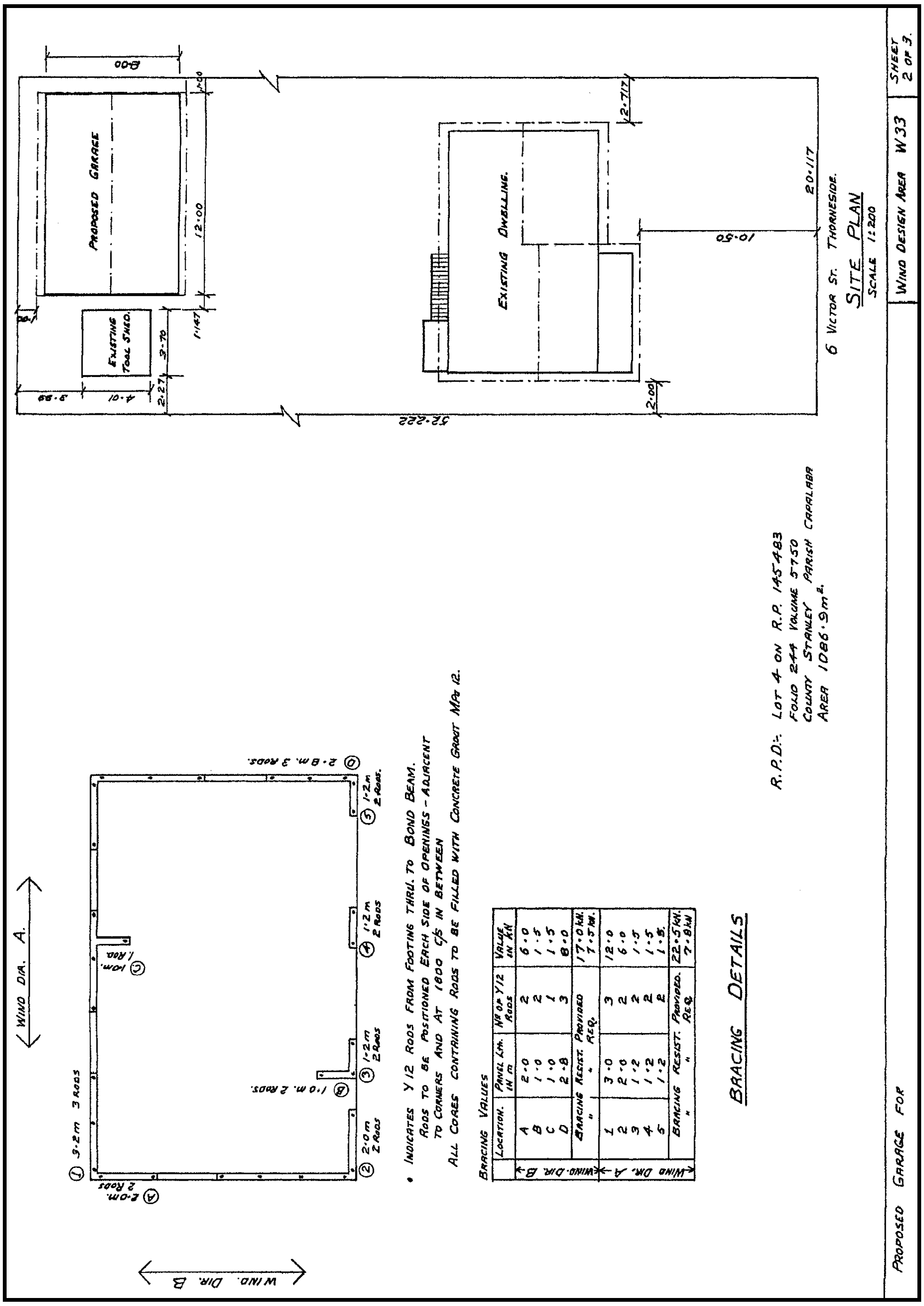


Figure 7: Concrete Block Garage – Bracing Details and Site Plans

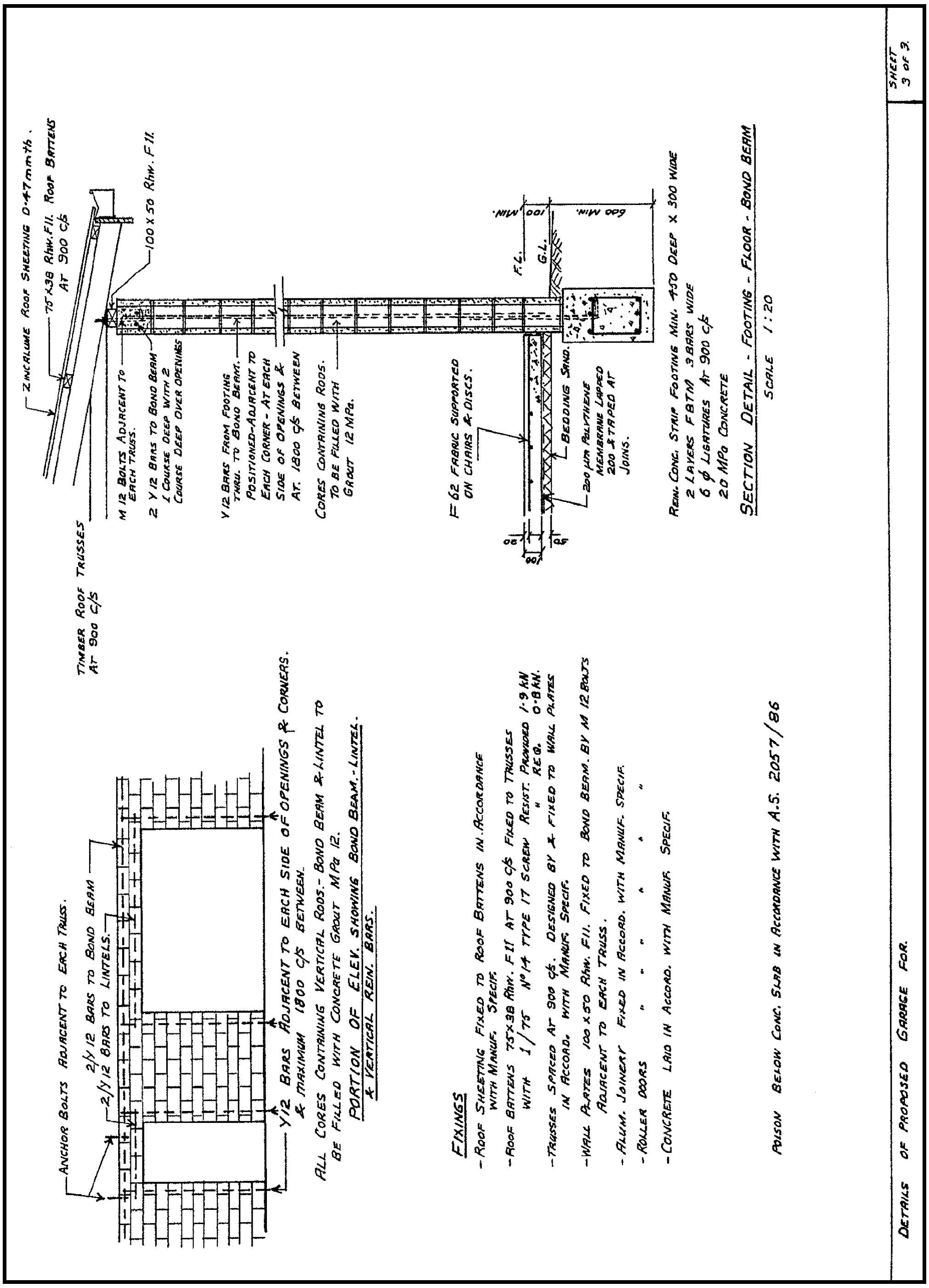


Figure 8: Concrete Block Garage – Structural Details

1. SITE PLAN

The site plan is a vertical plan view of the building site or allotment. It identifies the location, shape, size and orientation of the construction site, and the position of the building or buildings on the site.

It may also give other details such as:

- real property description. (R.P.D.)
- area of allotment
- access roads
- service points
- contour lines
- significant physical features
- storm water drainage.

The North point is always shown on the site plan to show the orientation of the site and the building/s.

Site plans are usually drawn to a scale of 1:200 with dimensions given in metres to two (2) decimal places.

Refer to *Figure 2*, and study the site plan and the information it conveys.

Figure 9 is a simple site plan used for orientation purposes only. The North point is indicated and from this you can determine the North, South, East and West boundaries likewise the North, South, East and West sides of the building.

Example 1

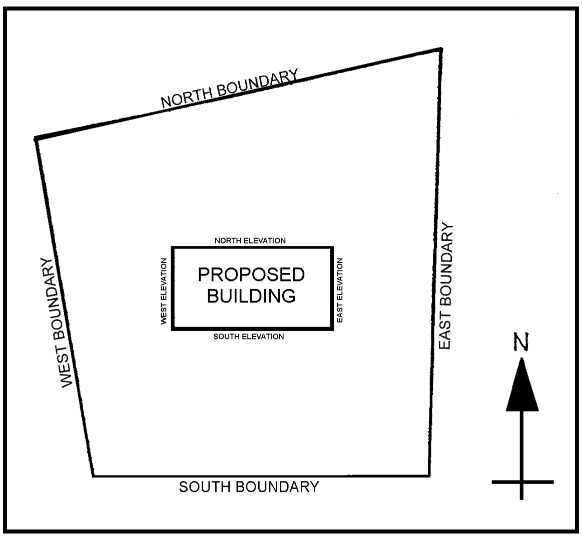


Figure 9: A Simple Plan Showing Orientation Only

With reference to *Figure 10* you will notice that it not only shows the distance the proposed office building is from the boundary lines but also the sewer main, sewer connection, underground power connection and the access drive to the adjacent street.

The position of a proposed future extension is shown in the North East corner.

The example site plan shown in F*igure 11*, in addition to other information, indicates a datum set out point and contour lines. From the contour lines you can determine the fall of the allotment which in this case falls 2.1m, along the East boundary from North to South and 0.5m along the South boundary from West to East.

You can also determine that the finished floor level (F.F.L.) is to be 1400 above the datum set out point.

Example 2

A site plan showing the access to the site from the adjacent street.

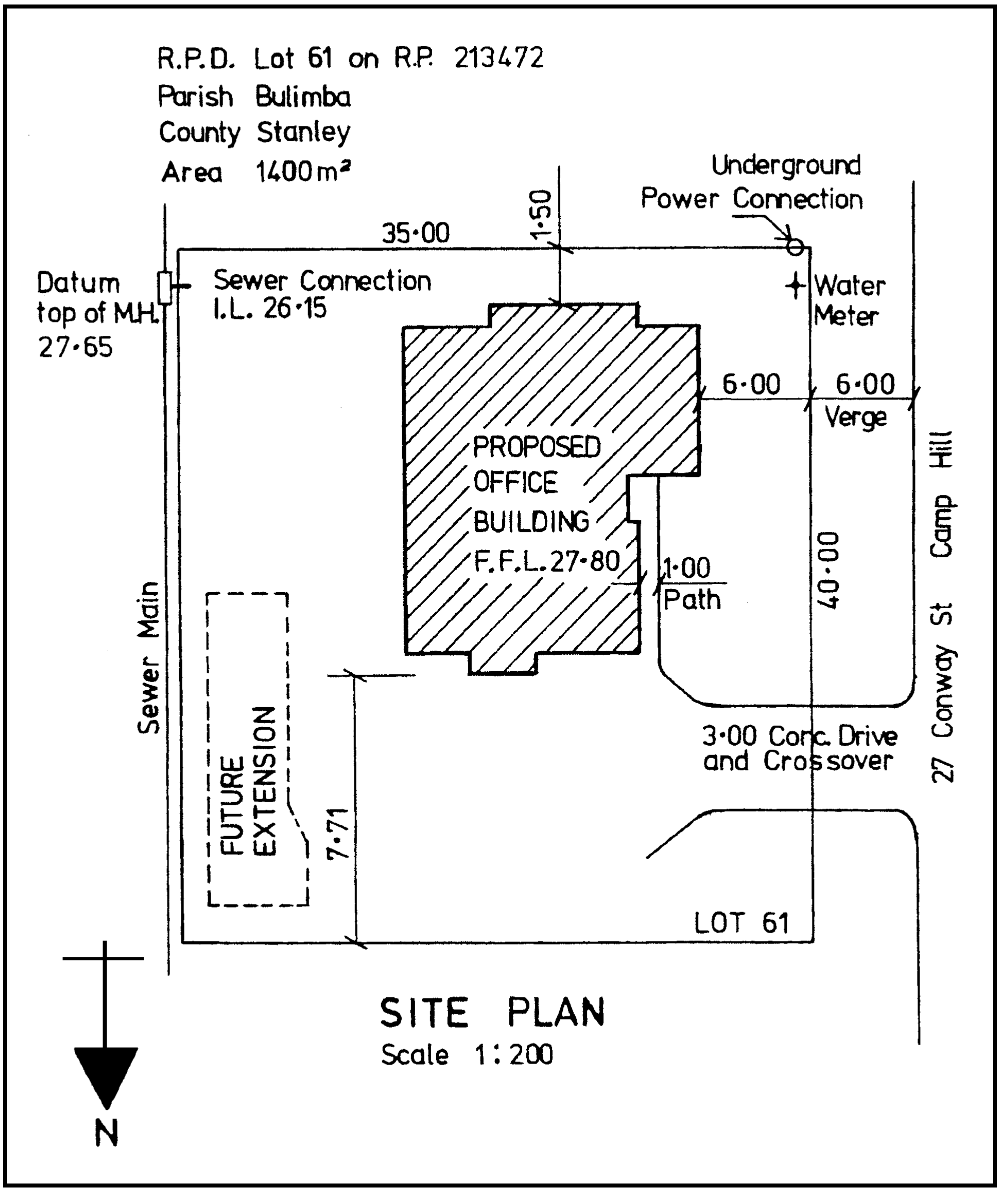


Figure 10: Site Plan

Example 3

A site plan showing contours, concrete driveway and paths.

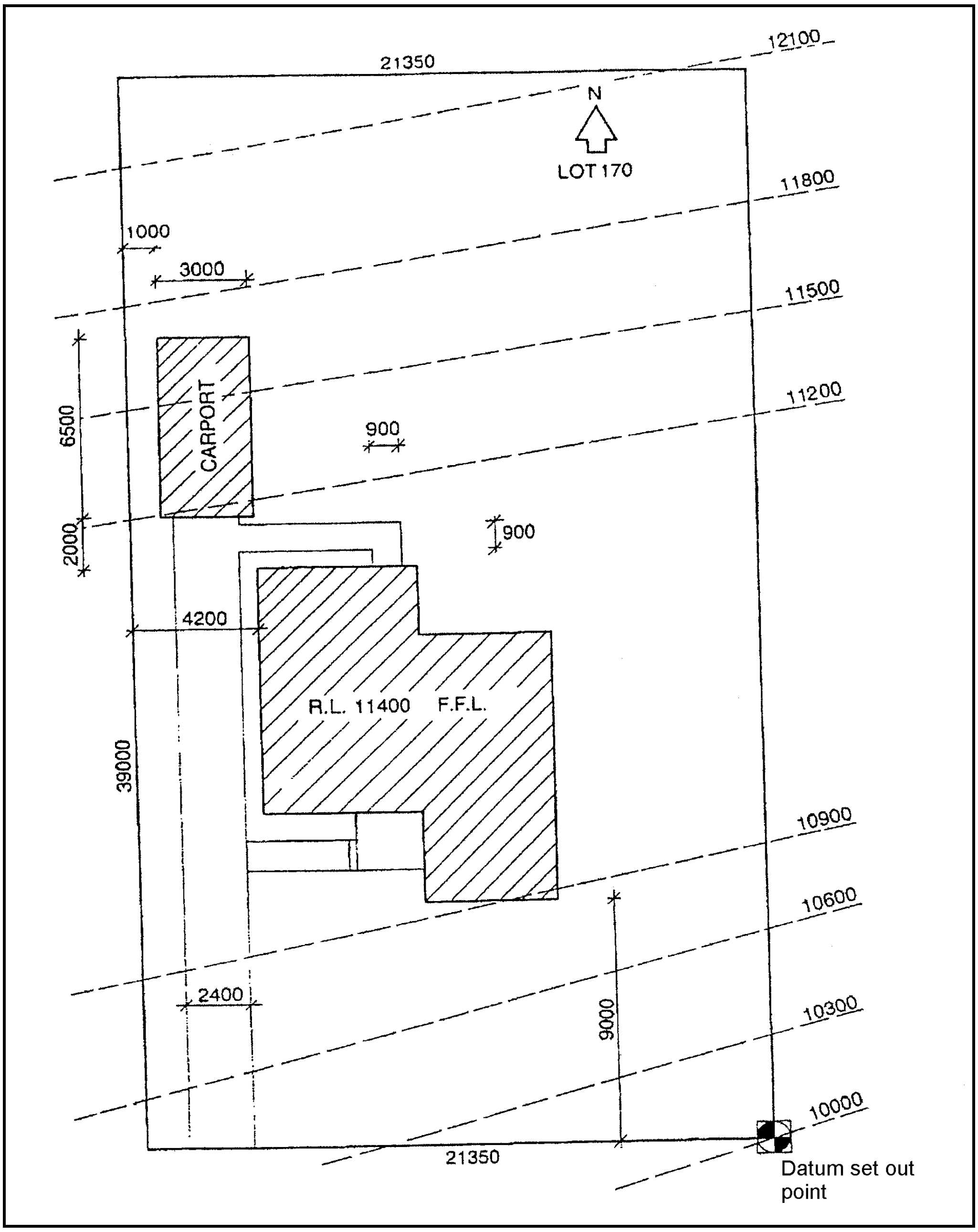


Figure 11: Site Plan – Scale 1:200

2. FOUNDATION PLAN

The foundation plan shows:

- thickness and width of all footings whether strip or isolated
- thickness of foundation walls
- size of columns and concrete slab
- thickness of concrete slab
- thickness and width of slab thickening - when required to support load bearing walls.

The size and type of reinforcement for concrete footings and slabs is often stated adjacent to the foundation plan.

Foundation plans are drawn to a scale of 1:100 and any dimensions are in millimetres.

Figure 12 is an example of a typical foundation plan for a brick veneer dwelling.

Note the reference to the construction of the concrete footing and slab.

Other examples appear in *Figures 2 and 6*.

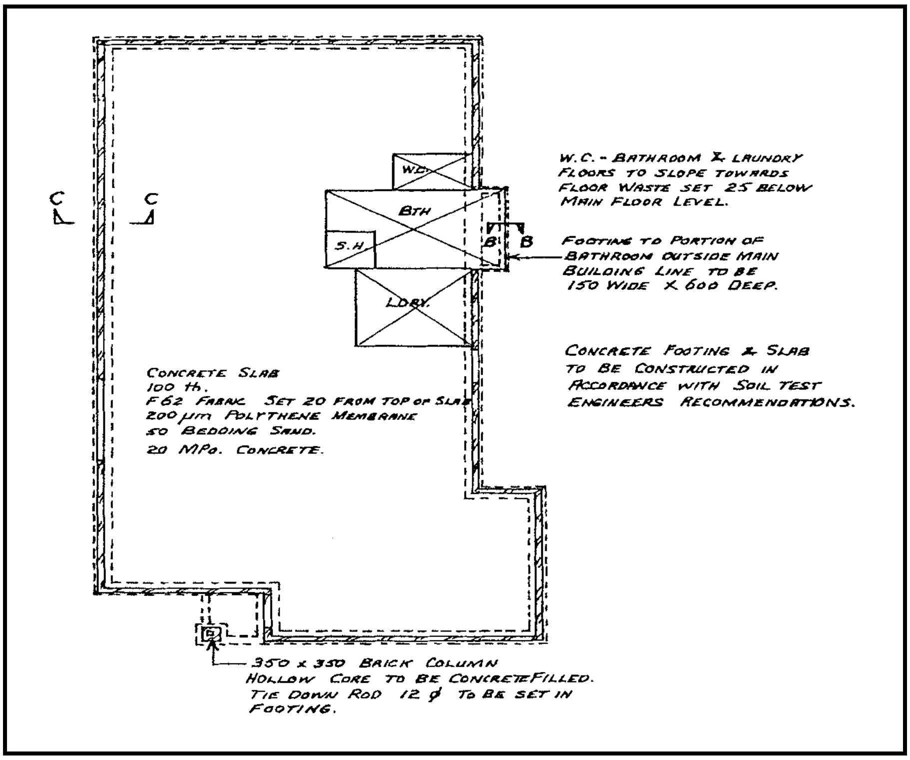


Figure 12: Foundation Plan

3. FLOOR PLANS

This plan usually gives more information than any other part of the working drawings and includes:

- overall shape and size;
- dimensions of individual rooms, patios, verandahs etc;
- thickness of walls, external and internal;
- position of openings, windows and doors;
- roof outline; and
- position of hanging and strutting beams if applicable.

Floor plans are usually drawn to a scale of 1:100 with the dimensions given in millimetres.

Figure 13 is an example of a floor plan for a timber framed dwelling sheeted externally with a material other than brick veneer.

A floor plan for a brick veneer dwelling is shown on *Figure 1* and *Figure 6* the floor plan for a concrete block garage is shown.

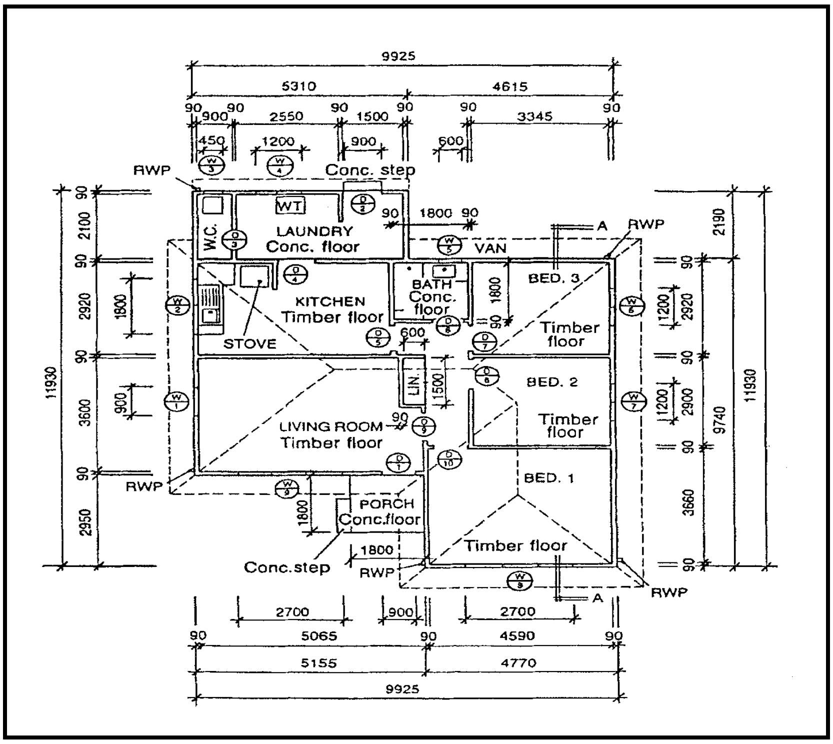


Figure 13: Floor Plan

Note the difference in how the external walls are indicated. Also note how the brick cavity wall to the lounge and dining rooms on the floor plan in *Figure 1* is shown.

4. ELEVATIONS

Most Local Authorities require elevations of the four (4) sides of a dwelling as part of a set of working drawings.

Each elevation is named according to the direction it faces for example **NORTH, SOUTH, EAST** or **WEST ELEVATION**.

Information shown on or adjacent to elevations is:

- windows and doors to external walls
- external cladding for example, brick veneer, chamfer boards, fibre cement etc
- general roof shape and slope (pitch)
- roof overhang
- handrail heights to verandahs if applicable.

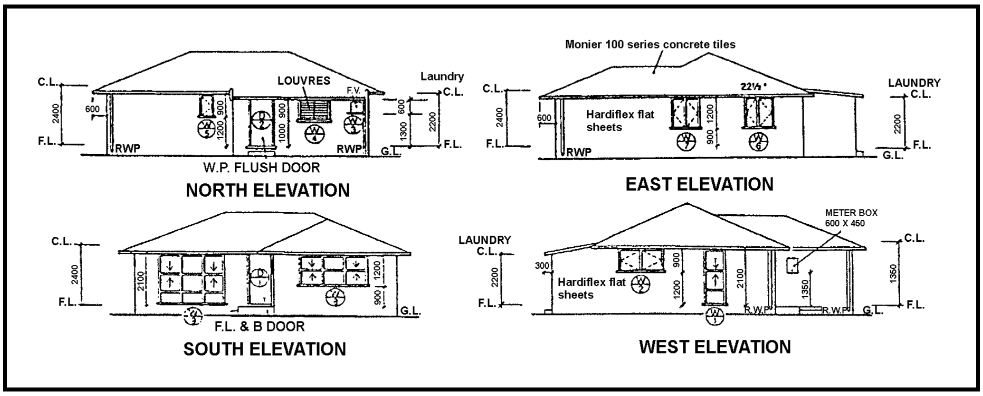


Figure 14: Elevations

5. SECTIONAL ELEVATIONS

This view is required by most Local Authorities. The section to be viewed is indicated on the floor plan by section lines which by the aid of the arrow heads indicate the direction in which the section is viewed.

The sectional elevation shows such information as:

- height of floor above ground level (G.L.);
- ceiling height;
- joinery line/height;
- handrail height if applicable; and
- depth of footings.

Figure 15 shows a typical sectional elevation for a brick veneer dwelling on a concrete slab.

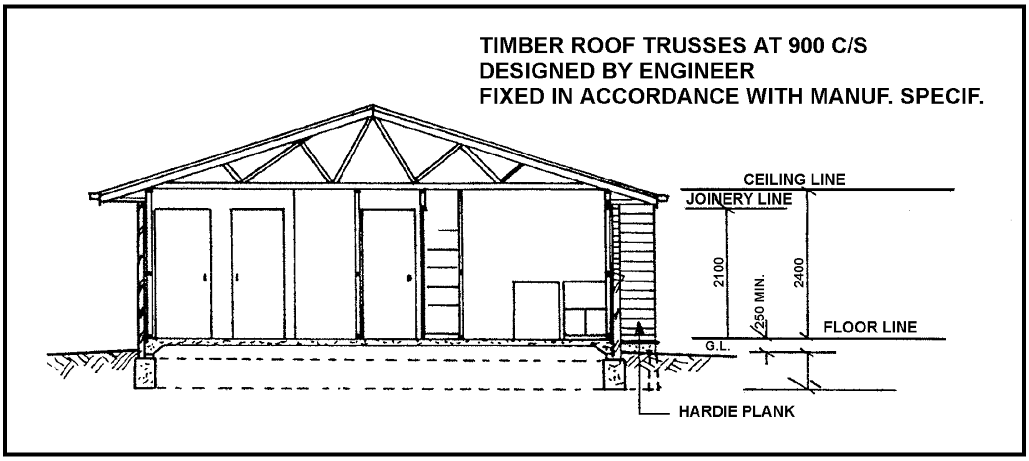


Figure 15: Section A – A Dwelling

6. SECTION DETAILS

These views are used when it is not possible or practical to show specific constructional details on small scale drawings, for example: 1:100 or 1:50 details are usually drawn at scales of 1:20, 1:10 or 1:5 for more accurate drawings the scale maybe 1:1 or 1:2.

Figure 16 is a vertical section showing details of the footing and floor slab junction.

Other sectional detail drawings are shown on *Figures 2, 5, 8, 17 and 31.*

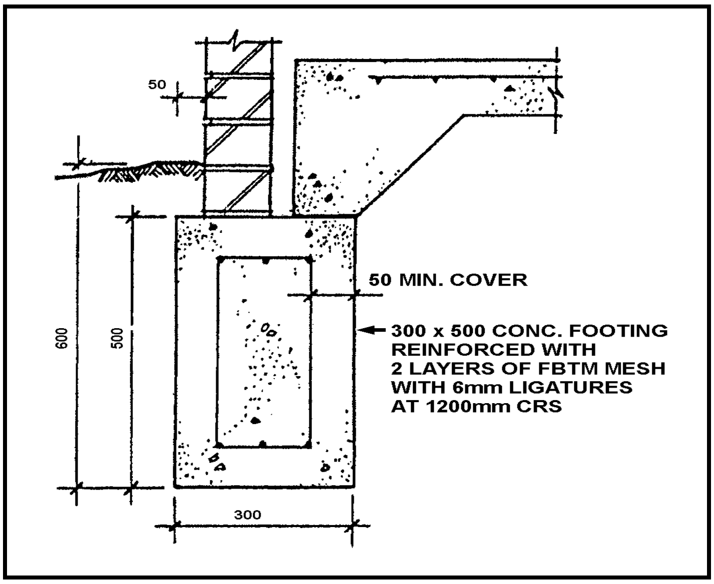


Figure 16: Section B – B Footing

7. BRACING PLAN

Some states require a bracing plan with the set of working diagrams for dwellings.

NOTE: This is a single line floor plan of the building showing the type, length and position of bracing panels.

A schedule of the bracing panels and their individual and total wind resistance value usually accompanies this plan.

Refer to *Figures 4, 7* and *18* for details of bracing plan.

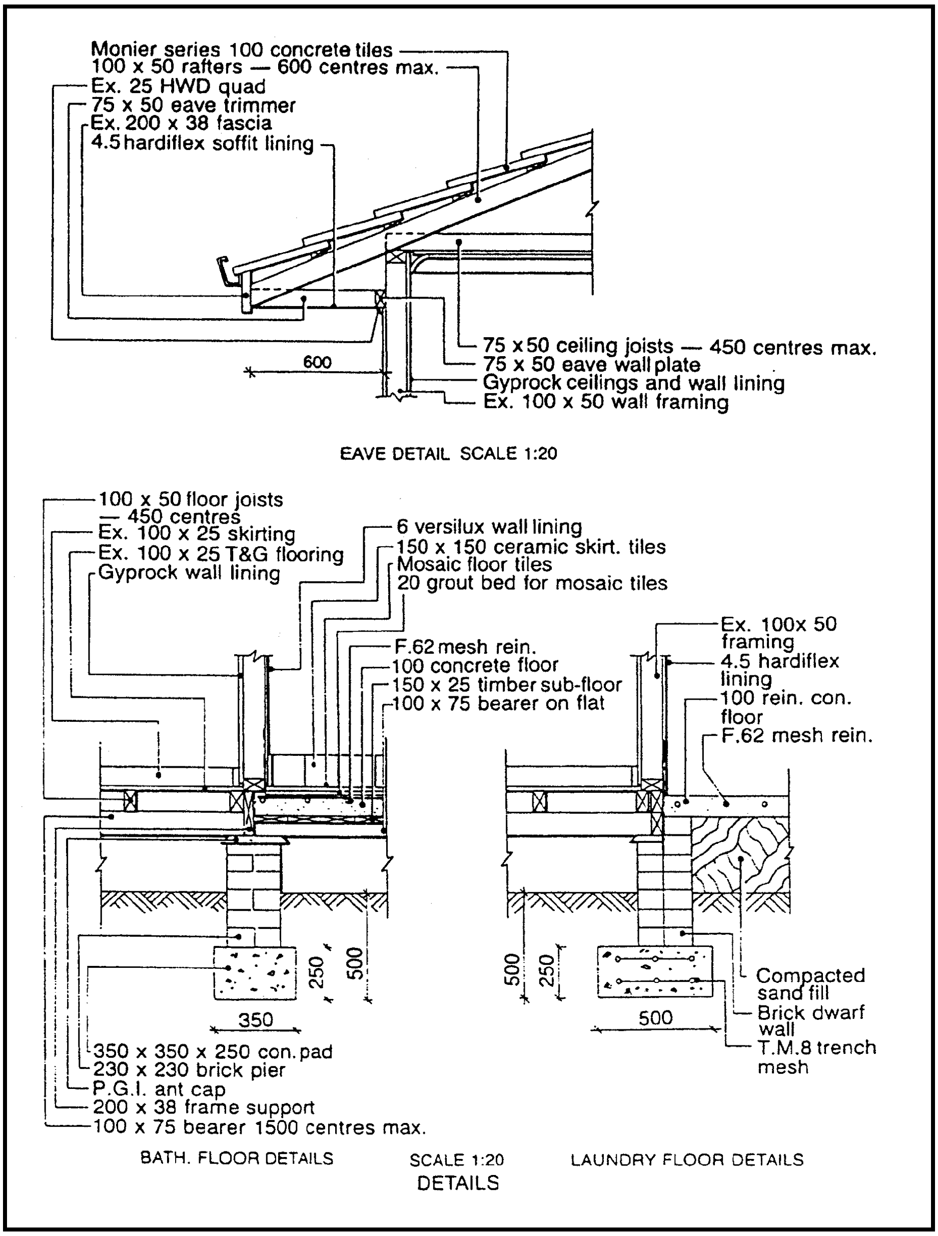
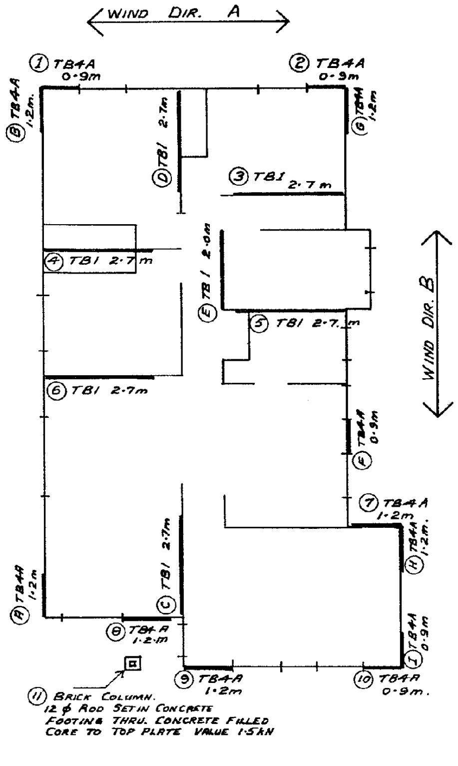


Figure 17: Details



BRACING PLAN

BRACING VALUES.

	LOCATION	TB1 1 kN/m	TB4A 2·25 kN/m	BRK. COL. 1·5 kN	TOTAL IN kN.
WIND DIR. A	1	0·9			2·025
	2	0·9			2·025
	3		2·7		2·7
	4		2·7		2·7
	5		2·7		2·7
	6		2·7		2·7
	7	1·2			2·7
	8	1·2			2·7
	9	1·2			2·7
	10	0·9			2·025
	11			No 1	1·5
	TOTAL PROVIDED				26·47kN
	AMOUNT REQUIRED				25·4 kN
WIND DIR. B	A	1·2			2·7
	B	1·2			2·7
	C		2·7		2·7
	D		2·7		2·7
	E		2·0		2·0
	F	0·9			2·025
	G	1·2			2·7
	H	1·2			2·7
	I	0·9			2·025
	11			No 1	1·5
	TOTAL PROVIDED				23·75
	AMOUNT REQUIRED				17·5

TB1 BRACING PANELS

- METAL ANGLE BRACE CONST'N IN ACCORDANCE WITH FIGURE 9·3·1 (B)(i)
- INTERNAL BRACING WALLS ARE TO BE TIED TO EXTERNAL WALLS AS PER FIG. 9·3·2 (I) 4/30 x 2·8 ϕ NAILS TO EACH END OF STRAP RESISTANCE REQ. 2·7kN RES. PROVIDED 4·4kN
- INTERNAL BRACING WALLS PARALLEL TO TRUSSES AS PER FIG. 9·3·2 F. 4/3·75 ϕ NAILS OR 1/M10 BOLT RESIST. 3·0 kN RESIST. 4·2 kN.
- INTERNAL BRACING WALLS AT 90° TO TRUSSES. AS PER FIG. 9·3·2 H. 4/3·75 ϕ NAILS. OR 1/M10 BOLT RESIST. 3·0 kN RESIST. 4·2 kN.

TB4A BRACING PANELS

- 4mm thick F14 STRUCTURAL PLY. FIXED IN ACCORDANCE WITH P.A.A. WALL BRACING DESIGN MANUAL. RESIST. VALUE. 2·25 kN. PER m.

Figure 18: Bracing Details

8. TIE DOWN

In a set of working drawings tie downs or special fixings are mostly shown in the form of a schedule or table that indicates how structural framing members are tied down or fixed to each other from the roof sheeting through to the footing.

Example:

- Roof sheeting to roof battens.
- Roof battens to rafters.
- Rafters to top wall plates.
- Top wall plate to studs.
- Studs to bottom wall plates.
- Bottom wall plates to concrete footing on slab.

Refer to *Figure 19* for an example of how the information can be set out.

TIE DOWN DETAILS

SPECIFICATION OF TIMBER FRAMING AND MATERIALS

ROOF SHEETING:	COLOURBOND ZINCALUME 0.48th – CUSTOM ORD		
ROOF BATTENS:	Rhw	F11	AT 900 C/S
ROOF TRUSSES:	RADIATA PINE		AT 900 C/S
EXT. WALL FRAMING:	SEASONED OREGON PINE F7 STRENGTH GR. JD4		
INT. WALL FRAMING:	SEASONED OREGON PINE F7 STRENGTH GR. JD4		
STUD SPACING:	450 C/S		
DIMENSION **A** MAIN ROOF:	4535		
DESIGNED WIND AREA:	W42		

Tie Down	Table No.	Uplift Force	Figure No.	Allowable Load kN	Description/Type
Zincalume Roof Sheet to Battens					As per Manufacturing
Roof Battens to Trusses	8.11	2.1kN	8.11H	2.5kN	1/90 No 14 type 17 screw.
Trusses to Top Plates					As per Manufacturing. Specifications
Top Plate to Studs at 900 C/S. Adjacent to each Truss	8.8	6.1	8.8B	7.2	30 x 0.8mm Galvanised Iron Looped Strap 4/30 x 2.8 Ⅱ Nails each end
Bottom Plate to Studs at 900 C/S	8.8	6.1	8.8B	7.2	as above
Bottom Plate to Concrete Slab	8.8	8.1	8.8A	19.0	1/M 12 bolt at 1200 C/S
Studs to sides of openings up to 1200 wide	8.10B	5.5	8.10B (1)	5.8	30 x 0.8mm G.I. Straps 6/30 x 2.8 Ⅱ Nails to each end of strap
Studs to sides of openings over 1200 and up to 2400 wide	8.10B	10.9	8.10B (ii)	12.0	as above
Brickwork to Timber Frame					Cavity Brick ties at 600 x 600 C/S
Hardie Plank					As per Manufacturing Specifications
Plasterboard Ceiling and Walls					As per Manufacturing Specifications
Aluminium Joinery					As per Manufacturing Specifications

Figure 19: Tie Down Details

NOTE: **The above information – calculations and figures are taken from Queensland Timber Framing Manual W42**

9. JOINERY SCHEDULE

The joinery schedule is usually shown in the form of a table and contains such information as:

- type of window or door
- size of item
- material used in its construction
- its position in the building.

Example of a Joinery Schedule:

JOINERY SCHEDULE

W1	1215	Anod.	Alum.	Sl.	Window.	
W2	0606	"	"	"	"	Perm. Vent.
W3	1012	"	"	"	"	Obscure Glass
W4	1009	"	"	"	"	
W5	1012	"	"	"	"	
W6	2012	"	"	"	"	Fixed Lower Light.
W7	2015	"	"	"	"	" " "

D1	2121	" "	Sl	Glass Door.
D2	2040 x 820	EXT	Main Entrance Door.	
D3	" "	"	Flush Panel with Half Light.	
D4	" "	INT	" "	Door.

Where W1 is window 1 referred to on the plan and D1 is door 1.

10. TIMBER LIST

The section size of the various timber framing members for a building are not always shown on the working drawings but if not they must be included in the specification.

The following is an example of how the section size of timber framing members are shown on a set of working drawings.

TIMBER FRAMING
UNLESS OTHERWISE STATED ALL TIMBER FRAMING TO BE SEASONED PINE STRESS GRADE F5 JOINT GROUP JD5

MEMBER	EXTERNAL	INTERNAL	REMARKS				
Bottom Wall Plates	70 x 35	70 x 35					
Top Wall Plates	2/70 x 35		Nail Laminated				
Top Wall Plates		70 x 35					
Common Studs at 450 C/S	70 x 35		Not Notched				
Common Studs at 450 C/S		70 x 35	May be Notched				
Studs to Sides of Openings up to 1200 wide	2/70 x 35	70 x 45	Nail Laminated				
Over 1200 and up to 1800	2/70 x 45	70 x 45	Nail Laminated				
Over 1800 and up to 2100	3/70 x 45		Nail Laminated				
Lintels							
W4 - W5 - D3	70 x 45						
W6 - W7	90 x 70						
W2	2/120 x 35		Nail Laminated				
W1	2/140 x 35		Nail Laminated				
D4 - D5		70 x 45					
Roofing Plate to Cavity Brick	100 x 50		Rhw	F11	Joint	Gr	J2
Verandah Posts	100 x 100		"	"	"	"	"
Verandah Plate	150 x 50		"	"	"	"	"
Rafters to Verandah 900 C/S	100 x 50		"	"	"	"	"
OR	120 x 35		Pine	F5	"	"	JD5
Roof Battens 900 C/S Max.	75 x 38		Rhw	F11	"	"	J2

Fascia Boards	200 x 25		Rhw				

SUMMARY

So far you have covered the information contained in a set of working drawings for a new dwelling and also gained a brief overview of the information conveyed by each view or table.

The knowledge you have gained so far will be used by you each time you commence a building project or need to manufacture internal fittings such as stairs, cabinetry or joinery. The importance of this information will become more evident as you progress through your course and trade.

If you are working in an off-site workplace you will not be using such detailed plans. However the skills you have developed will still be of use in your workplace.

Self-Check Exercises in this package are on *yellow pages*. This first exercise has been designed to test your understanding of the information you have covered so far. *Remember that the self-check exercises are not part of the formal assessment of competency for this module.*

Answers to the self-check questions are on the *blue pages* at the end of the package.

You may find it useful to make your own brief summary/notes below of the ten topics on Working Drawings.

Site Plan

Foundation Plan

Floor Plan

Elevations

Sectional Elevation

Section Details

Bracing Plan

Tie Down/Fixings

Joinery Schedule

Timber List

SELF-CHECK

EXERCISE 1: WORKING DRAWINGS

1. An approved plan or working drawings are required to enable

____

____

2. State the names given to each part or view of a set of plans for the construction of a house.

(i) ____________________ (ii) ____________________

(iii) ____________________ (iv) ____________________

(v) ____________________ (vi) ____________________

(vii) ____________________ (viii) ____________________

3. The position of a building on an allotment is indicated on the ____________________ .

4. The information found on floor plans includes:

(i) ____

(ii) ____

(iii) ____

(iv) ____

(v) ____

5. Elevations are identified according to the ______________________________ .

6. Three items of information that are shown on or adjacent to elevations are:

   (i) ____________________

   (ii) ____________________

   (iii) ____________________

7. Section details are usually drawn to a larger scale for example 1:10 because it is not practical to show ____________________ on small scale drawings.

8. Some of the information that can be obtained from a full sectional elevation is:

   (i) ____________________

   (ii) ____________________

   (iii) ____________________

   (iv) ____________________

   (v) ____________________

9. Bracing plans are single line floor plans that indicate the ____________________

   ____

10. The information given in a joinery schedule is:

    (i) ____________________

    (ii) ____________________

    (iii) ____________________

    (iv) ____________________

PLANS

Why Do Plans Have to Be Drawn?

Plans are drawn to accurately describe a particular object or building to all interested parties before it is constructed. If accurate plans are prepared then the proposed building will be fully understood by the Local Authority who approve the plans, and the builder and trades persons who will build it.

Everyone has to work to some sort of plan, in order to meet the customer's requirements. On large construction jobs, very detailed plans are needed. In the off-site construction industry where you may be working to produce anything from:

- shop fittings
- pre-fabricated housing components
- headstones
- signs
- plans may be less detailed.

The plans are not as detailed. They still give information such as:

- what you are making, including sizes and design
- the materials to use
- where to install the product, if required
- how to install the product.

Information Found on Plans

Plans will show:

- the location and size of the spaces in the building
- the materials that are to be used
- the location of the building on the site
- special fittings and finishes
- in some cases the layout of services eg. power and gas.

Who Draws Plans?

Trained drafters prepare the detailed plans that builders use.

Drafters are trained to draw the plans following a set of standard guidelines used by everybody in the drafting profession.

The next section explains the techniques used by drafters when drawing plans.

They are:

- Orthographic projection
- Planes of projection
- Line types
- Dimensions
- Notes, lettering and abbreviations
- Sectional views
- Scales and the Scale Rule.

You may find it useful to gather some examples of plans or job instructions you use in your workplace and discuss with your trainer the information contained in the plan. Remember, some plans are more detailed than others.

11. ORTHOGRAPHIC PROJECTION

Everyday objects have three (3) dimensions, for example:

- length
- breadth or width
- height.

All of the objects in *Figure 20* can be represented pictorially, but the drawings can get very cluttered when additional information is added, so another method is used where the object is represented by drawing a series of different views. This is called ORTHOGRAPHIC PROJECTION.

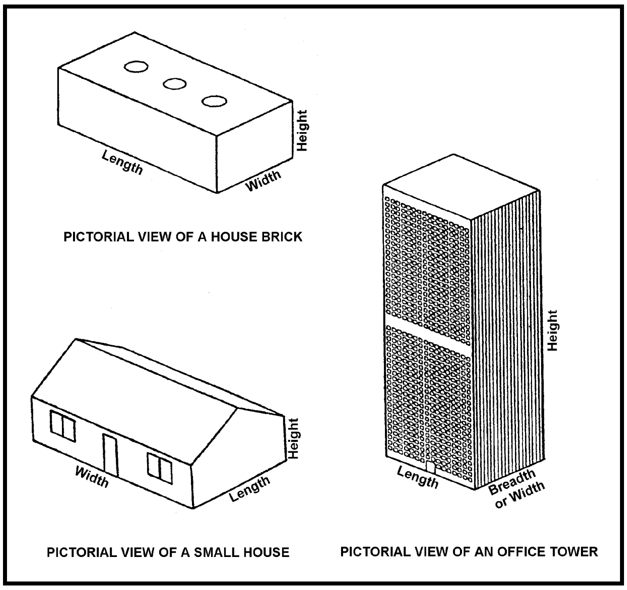


Figure 19: Orthographic Projections

Orthographic projection involves drawing three different views of an object.

These are:

- front view or front elevation;
- side view or end elevation; and
- top view or plan.

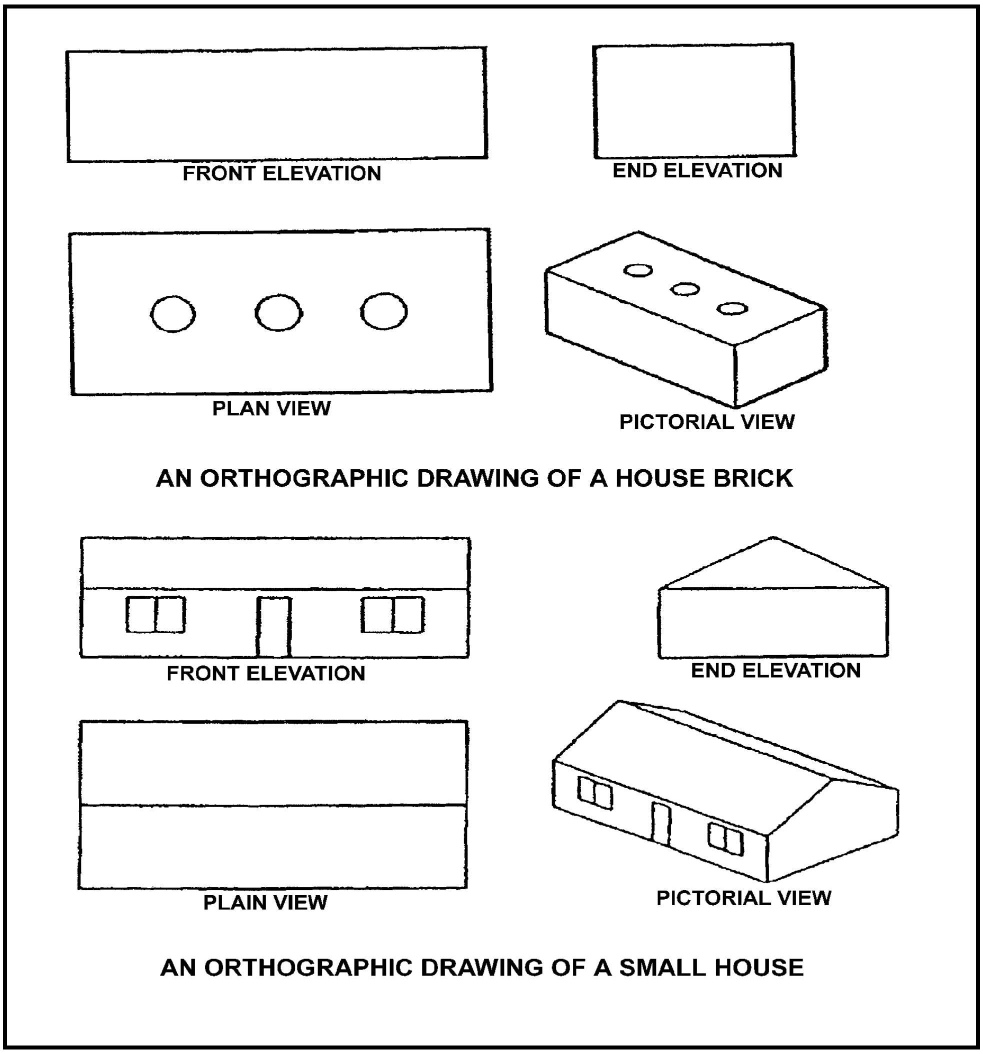


Figure 20: Orthographic Views

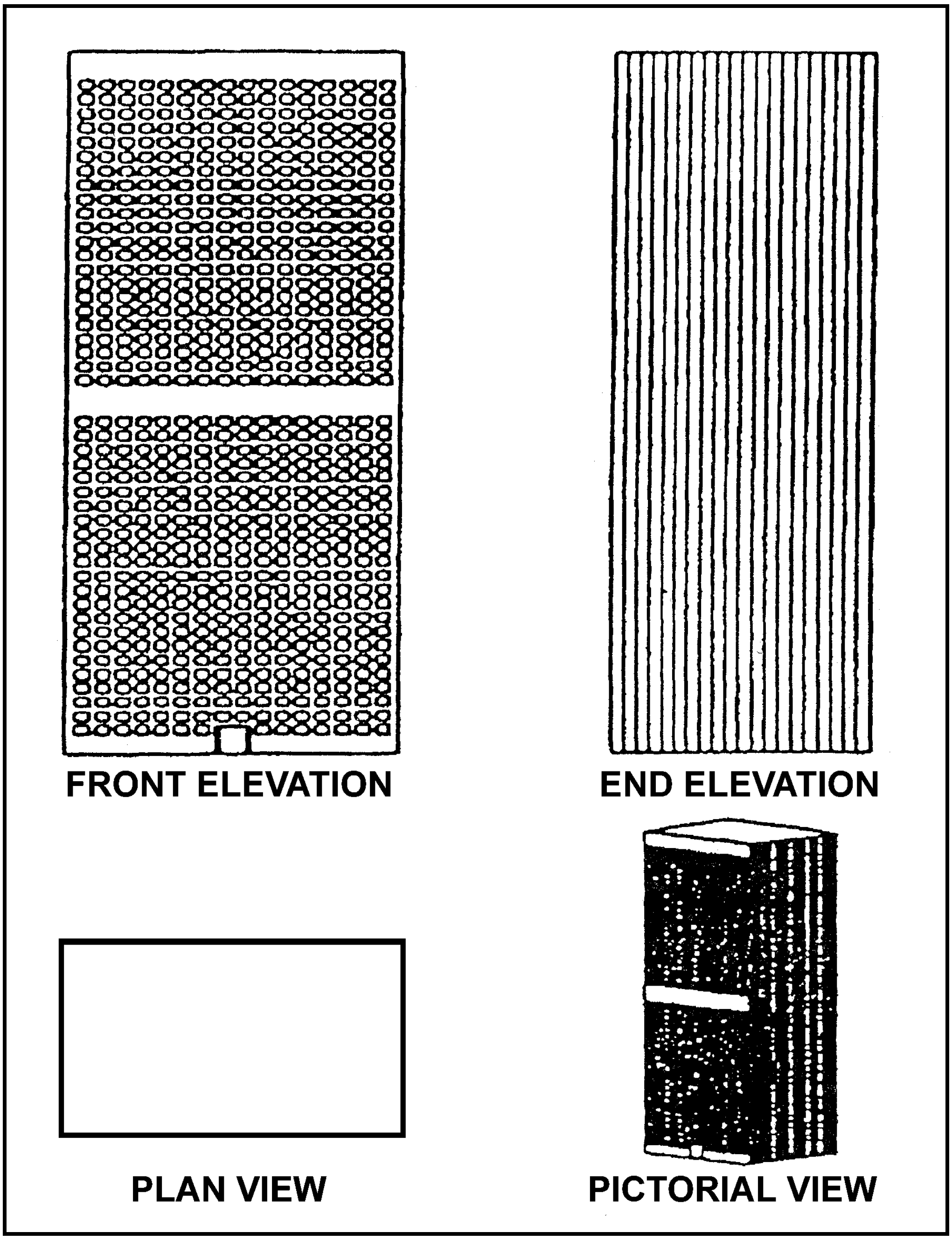


Figure 21: An Orthographic Drawing of an Office Tower

More views may have to be prepared. This will depend on the complexity of the object.

On the three examples given, notice the arrangement of the views on the drawing sheet. This is a standard arrangement, which is known as orthographic projection.

12. PLANES OF PROJECTION

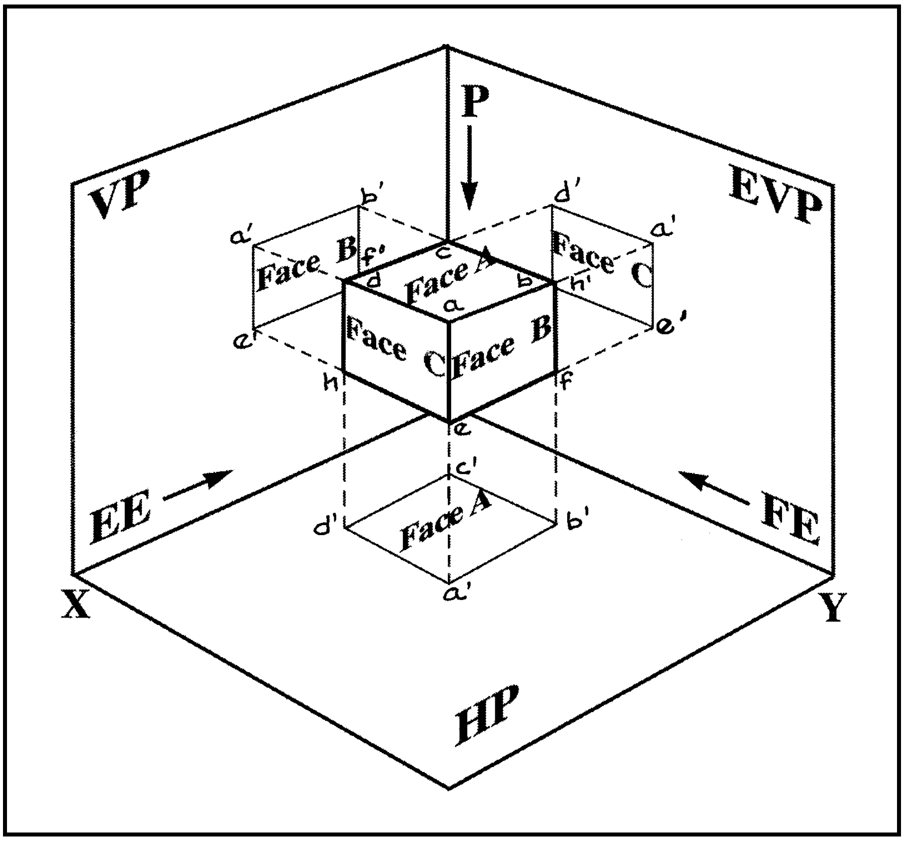


Figure 22: Pictorial View of First Angle Project

LEGEND:

HP	-	Horizontal Plane
VP	-	Vertical Plane
EVP	-	End Vertical Plane
P	-	Plan
FE	-	Front Elevation
EE	-	End Elevation

Orthographic Projection Procedure

Orthographic projection is the drawing of plans and elevations on horizontal and vertical planes by projecting lines perpendicular to the respective plane from every point of the object.

Working drawings consist of as many views as are necessary to completely define the object.

Figure 23 is a pictorial view of first angle projection which is used in the building and construction industry. The engineering industry uses third angle projection which you may have used if you have previously studied a drawing subject

NOTE: Refer to *Figure 23* whilst studying the following three (3) topics:

Horizontal Plane (HP)

The plan view, face A, is drawn on this plane, HP, by projecting from every point on the object seen when looking in the direction of arrow P (from Figure 22) at 90° the horizontal plane.

Vertical Plane (VP)

The front elevation face B, is drawn on this plane, VP, by projecting from every point on the object seen when looking in the direction of arrow FE (from Figure 22) at 90° to the vertical plane.

End Vertical Plane (EVP)

The end elevation, face C, is drawn on this plane, EVP, by projecting from every point on the object when looking in the direction of arrow EE (from Figure 22) at 90° to the end vertical plane.

The object, in this case a rectangular block of timber, is viewed as shown in *Figure 23*. Each view is described separately on a plane, ie a sheet of drawing paper as it exists in that view. See *Figure 24*.

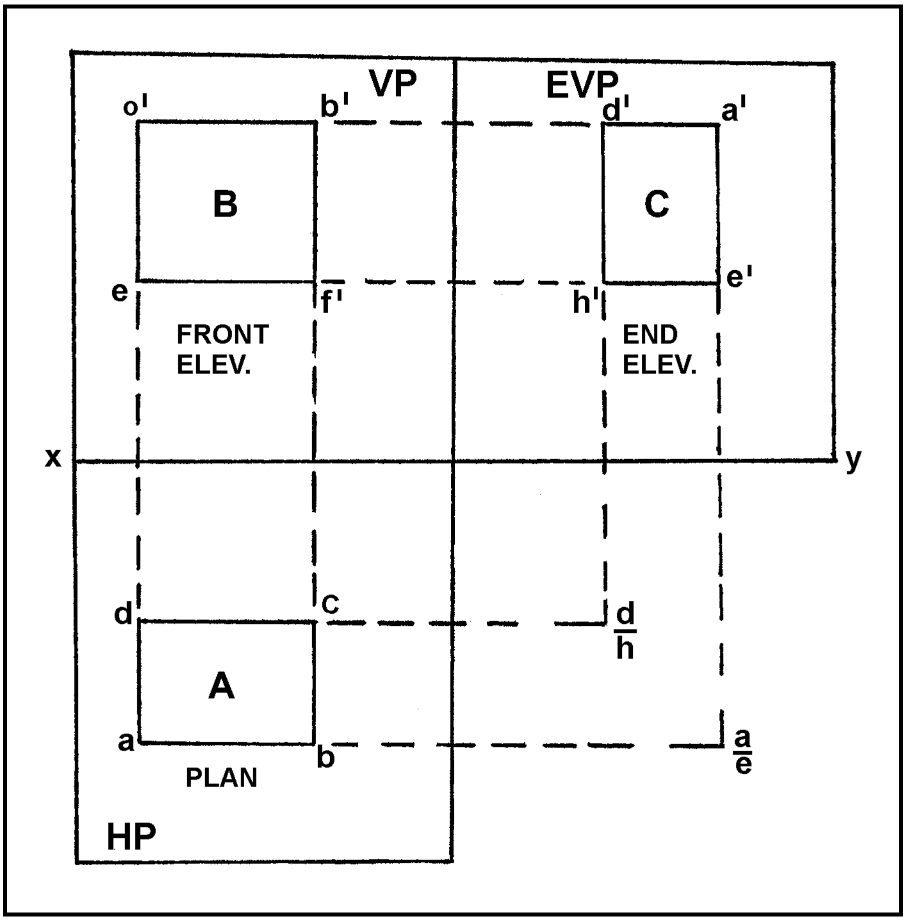


Figure 23: Plans Laid Out as a Flat Surface Drawing Sheet

Each view is one of a group of drawings arranged so that they fully describe the object. In many cases showing three views is sufficient, but depending on the object, four or more views may be needed to fully describe the object.

The views shown, in *Figures 24* and *25* show respectively pictorial and orthographic views of a garage.

This type of drawing, **orthographic**, is better than other types of representation because it gives the necessary information to enable the object/building to be constructed. It allows dimensions and details to be shown with out making the drawing cluttered with information as you would get in pictorial views.

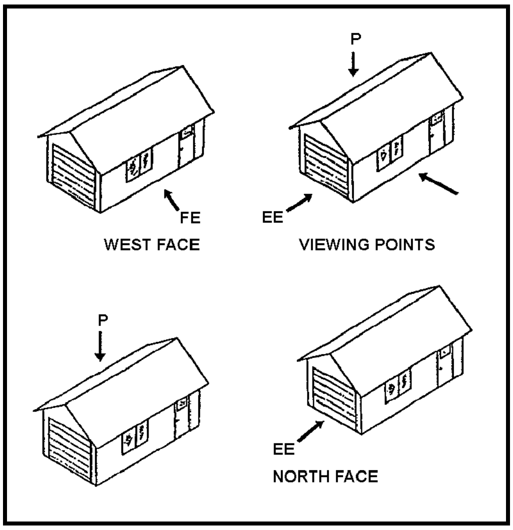


Figure 24: Pictorial Views – Garage

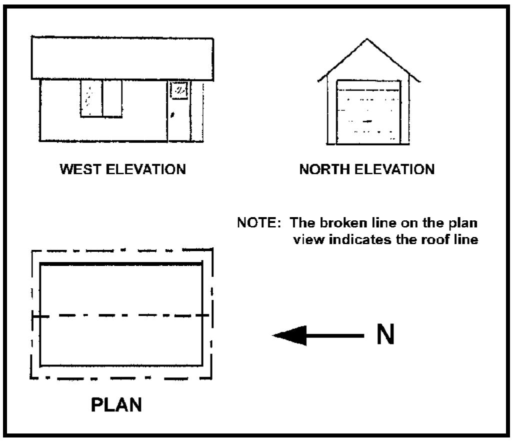


Figure 25: Orthographic Views – Garage

In orthographic drawing we get:

- a view showing the top surface, the plan
- a view showing the front surface, front elevation
- a view showing the end surface, end elevation

In plans for the construction of dwellings the elevations are usually designated as North, South, East and West. The side of the building facing the cardinal points of the compass are given that respective title. Refer to *Figures 26.*

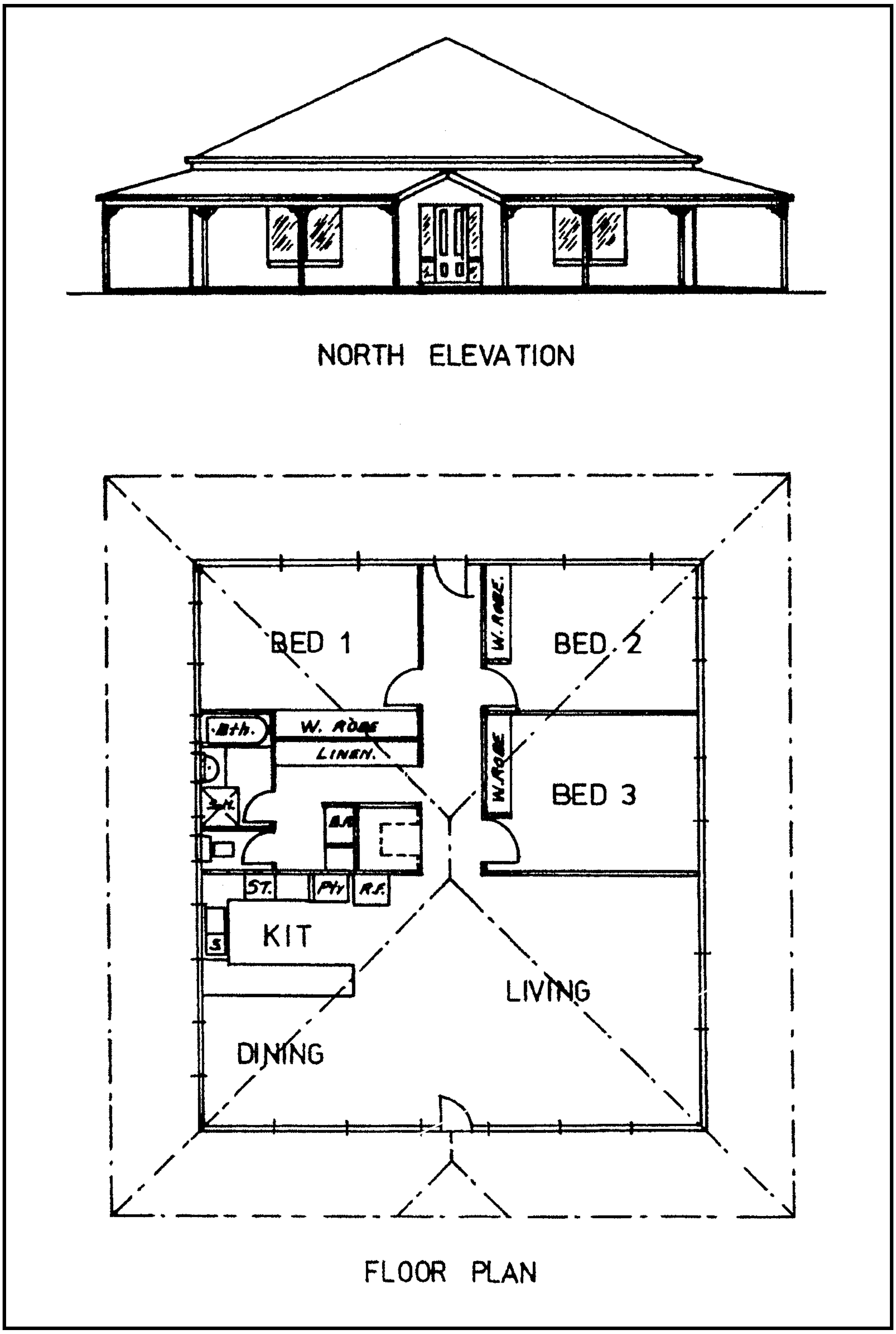


Figure 26: Floor Plan and Elevation

13. LINE TYPES

Using single continuous lines can be very limiting when plans become more complex. Drafters overcome this by using a variety of line types to help distinguish between particular features and help to highlight certain important information in different circumstances.

For example, here are some different types of lines and their uses.

CONTINUOUS

Continuous lines are used for general line work and can range from thin to very thick depending on what they represent.

DASHED

Dashed lines are usually used for hidden detail and items at different levels, eg overhead cupboards, beams etc.

CENTRE

These two variations are often used to show the roof lines on the plan.

PHANTOM

It is easy to develop your own alternatives that can be used in conjunction with a legend on very 'busy' plans.

Different line types are used to highlight relevant information that needs to be indicated but is not strictly part of the plan at that level. For instance, the position of pipes under the ground or floor level, or perhaps the position of important details above, like a roof, a wall or a beam.

Different line types are also used to highlight items where a plan is very congested. For example, making a line thicker or heavier.

In many instances where dotted or different line types are used there is a note to assist the viewer in understanding what is being shown.

Figure 27 shows some examples.

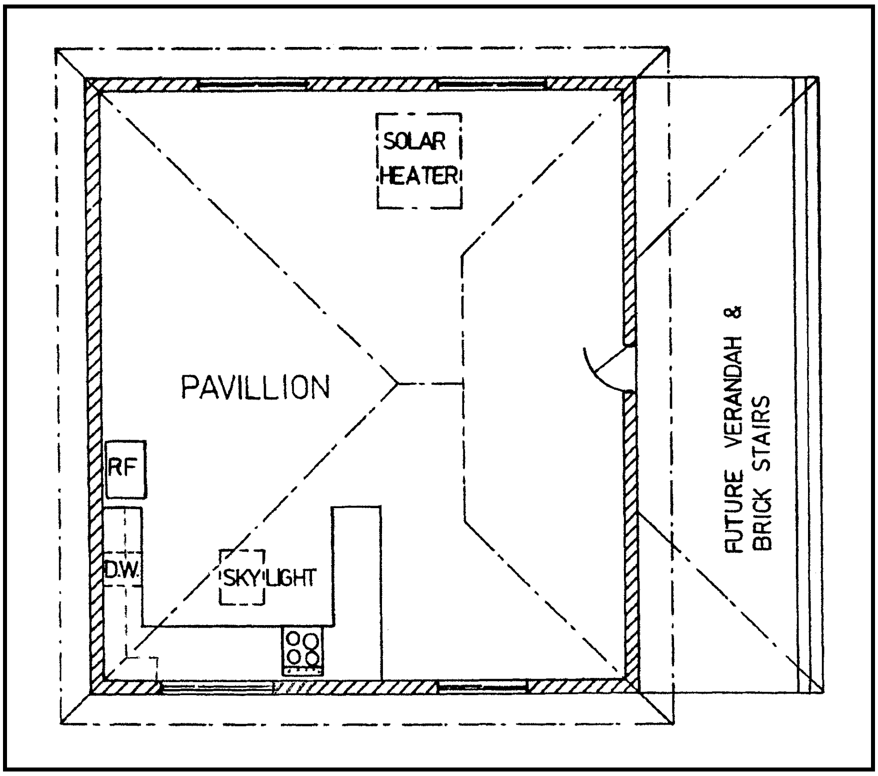


Figure 27: Line Types

14. DIMENSIONS

A dimension is a numerical note which describes the physical size of an object on a drawing and is usually shown in millimetres (mm), the exception being on site plans where the dimensions are indicated in metres to two (2) decimal places. Refer to *Figure 28*.

It is the drafter's responsibility to make the dimensions as easy to understand as possible.

In the preliminary stages of a project only the major overall sizes of the building are usually shown.

When the working drawings are prepared it will be necessary to provide **all** the dimensions required to construct the building.

Figures 28 and 29 show some examples of different types of dimensions found on plans.

This is the type of basic dimensions that is used on preliminary drawings.

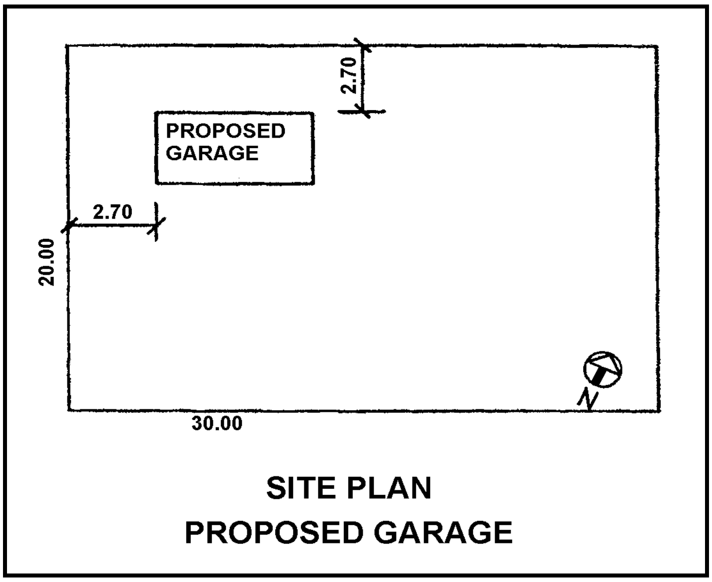


Figure 28: Site Plan – Dimensioning

This is typical of the sort of dimensions that is used on working drawings.

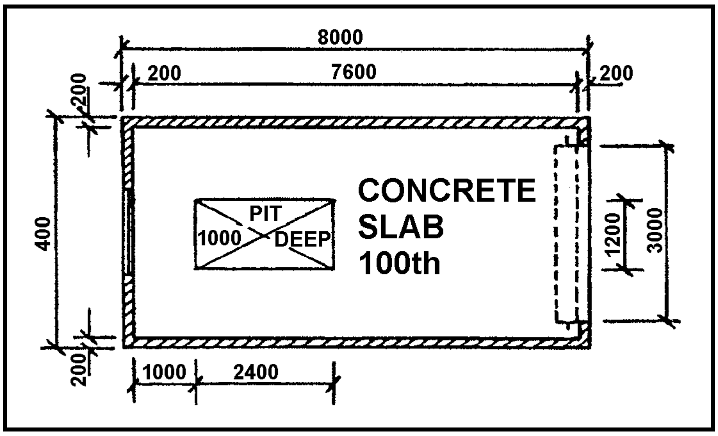


Figure 29: Proposed Garage Plan

NOTE Overall dimensions are shown furtherest from the drawing.

15. NOTES, LETTERING AND ABBREVIATIONS

An important aspect of any set of plans are the written notes which are always evident.

Notes are provided to further explain aspects of the construction that are perhaps difficult to draw, eg colour, fixing details, etc.

Notes can be provided on the drawings with arrows pointing at the relevant part, or they can be in the form of a list with a suitable heading to help the reader. Notes should always be relevant and cross referenced to a part of the drawing.

The use of abbreviations is a vital part of the notation as they save repetition and time and they avoid the unnecessary wasting of valuable space. Standard abbreviations must of course be used at all times, and the Australian Standard 1100.301 provides a very comprehensive list.

Special lettering techniques are also necessary to highlight information of importance, for example, a north point, a section line, room names, drawing titles.

16. SECTIONAL VIEWS

Sectional views are a means used by the designer or draftsperson to provide further information to the builder and/or trades person on construction details that do not show up clearly in the general working drawings.

A section can be either an elevation or plan view.

To draw a sectional elevation or sectional plan you imagine a vertical or horizontal plane cuts through that portion of the structure that will best give the details required. An elevation or plan view is drawn where the imaginary cut is made.

The position of this imaginary cutting plane is identified on a full elevation or plan by a section line with an arrow at each. This indicates the direction in which the section is taken. These section lines are also identified by letters for example A-A or B-B. Refer to *Figure 31* and note section lines A-A and B-B which indicate where the sectional elevations in *Figure 30* are taken.

Detail Sections are drawn to a larger scale than the main drawings, example 1:20, 1:10 or 1:5.

Footing and Slab Detail

The detail construction for a concrete footing and slab is usually drawn to a scale of 1:10.

Refer to *Figure 31* which shows a detail Section A-A of the thickening of the slab under a load bearing partition and section B-B which is a section through the concrete footing and adjacent construction.

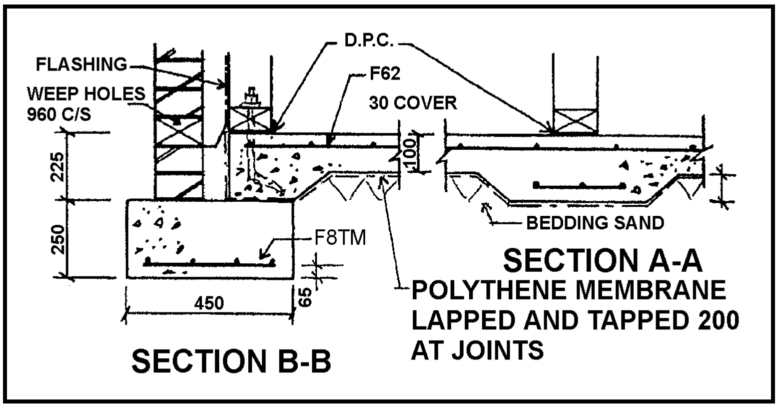


Figure 30: Detail Footing – Slab Section

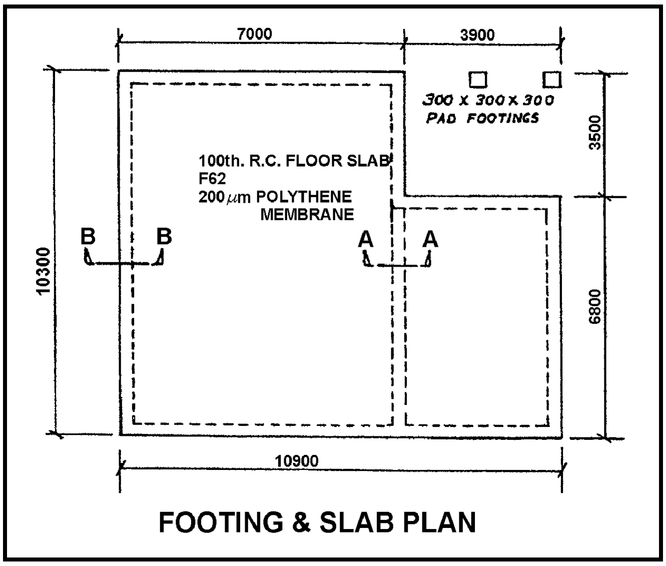


Figure 31: Footing and Slab Section

Section B-B shows the section sizes of the concrete footing, position and size of the reinforcement for both the concrete footing and floor slab, D.P.C. under wall framing, polythene membrane under the concrete slab, flashing in the wall cavity, weep holes and the relative positions of walls be they brick or timber.

This view also shows the thickness of the concrete floor slab and the shape of the edge thickening for the slab. Section A-A indicates the shape and extra reinforcement required for the thickening of the slab under load bearing partitions.

17. SCALES AND THE SCALE RULE

A scale rule is essential for trade drawing. The scale rule required for the construction industry is described in AS 1212 - 2/300. This rule provides scales in ratios 1:1; 1:5; 1:10 and 1:100 on the face side. On the reverse side scales of 1:20; 1:200; 1:50 and 1:500 are calibrated.

The scale rule should not be used as a guide for drawing lines.

NOTE: Students will find a 400mm clear plastic rule, clearly graduated in millimetres a very useful instrument. Among other uses it can be used as a line guide on the tee square if the edge of the tee square has been damaged through misuse.

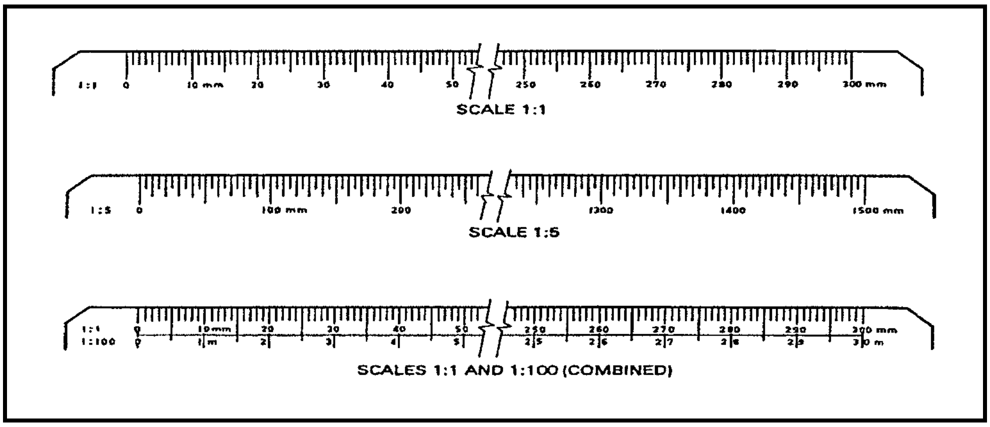


Figure 32: Scale Rule Examples

Preferred Scales for Architectural Drawings

The scale selected for a particular drawing should be determined by consideration of:

- The type of information to be communicated
- The need for the drawing to adequately and accurately communicate the information necessary for the particular work to be carried out
- The need for economy of time and effort in drawing production
- Requirements of building or lending authorities
- Complexity of item being drawn
- Size of drawing sheet adopted.

The preferred scales used for various architectural design drawings are shown in table form on the next page.

PREFERRED SCALES FOR ARCHITECTURAL DRAWINGS

DESIGN DRAWINGS		
Drawing	**Recommended Scales**	**Use**
Sketch Plans	1:200 1:100 1:50	To show the overall design of the building
PRODUCTION DRAWINGS		
Location Drawings		
Block Plan	1:2000 1:1000 1:500	To locate the site within the general district
Site Plan	1:500 1:200	To locate building work including services and site works - on the site.
General Location Drawings	1:200 1:100 1:50	To indicate the juxtaposition of rooms and spaces, and to locate the position of components and assemblies.
Special Area Location Drawings	1:50 1:20	To show the detailed location of components or assemblies in complex areas.
Construction Detail Drawings		
Construction Details	1:20 1:10 1:5 1:2 1:1	To show the interface of two or more components and assemblies for construction purposes
Component and Assembly Drawings		
Range Drawings	1:100 1:50 1:20	To show in schedule form, the range of specific components or assemblies to be used in the project.
Component and Assembly Details	1:10 1:5 1:2 1:1	To show precise information of components and assemblies for workshop manufacture.

READING THE SCALE RULE

Because buildings are large, scale drawings have to be used. When reading drawings or when preparing drawings to scale, you must be able to read the scale rule.

A scale rule is similar to an ordinary rule in having graduation lines marked at one millimetre intervals, longer lines at the five millimetre marks and even longer lines at the ten millimetre marks. The ten millimetre marks also show the graduation number. However, on a scale rule the graduation number indicates the scaled up value rather than the true length.

For example, refer to *Figure 33* below, and notice that along the top of the rule there is a scale of 1:20 and below it is a scale of 1:200. This means that if we are reading a scale of 1:20, a true length of 10mm represents 200mm, 20mm represents 400mm, etc. In other words, the true length is multiplied by (or scaled up) by 20. Notice that the scaled up values are shown. Similarly, reading the 1:200 scale, 10mm true length is shown as 2m (or 2000mm).

We have to mentally multiply the intermediate millimetres by the scale factor to obtain the exact measurement. For example, the 640 measurement read on the 1:20 scale shown in Figure 34, is 600mm plus (2mm x 20). If we were reading the 1:200 scale, the measurement would be 6m plus (2mm x 200) or 6.4m or 6400mm. Similarly the 7400 measurement read on the 1:200 scale is 6m + (7mm x 200) or 7400mm. Of course, on the 1:20 scale, the measurement would be 740 mm.

Examine your scale rule and notice that a number of scales are available depending on the type that you have. Notice that each set of graduations has two scales, one ten times the other. When you use the rule, select the scale to match the scale of the drawing.

Your instructor will assist you to understand the reading of the scale rule before you commence the scale drawing self-check exercise.

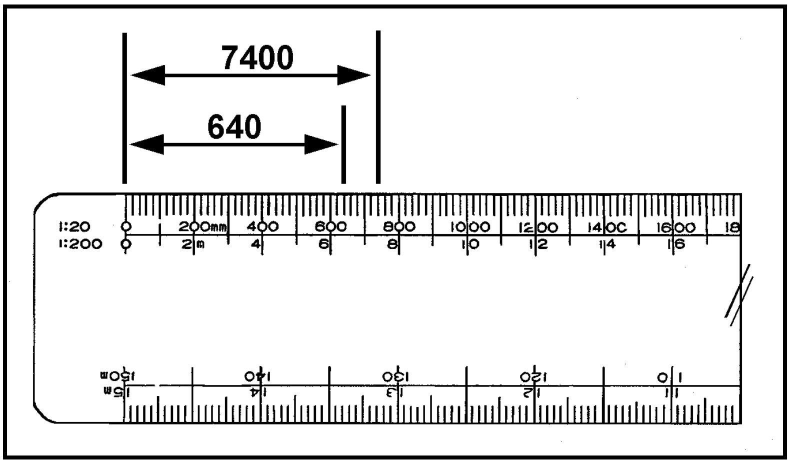


Figure 33: Reading the Scale Rule

Figure 34 is the plan of a rectangular building 11 000 by 6 000mm drawn to the scale of 1:100. This means 1 unit on the drawing represents 100 units on the building.

Figure 35 is the same building drawn to the scale of 1:200

At this scale 1 unit on the drawing represents 200 units on the building

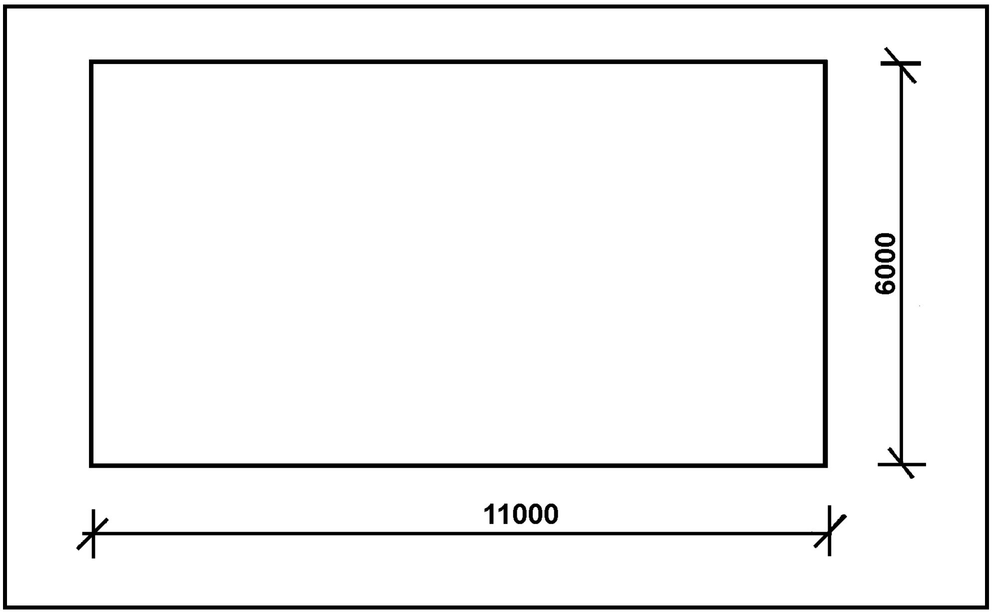


Figure 34: Plan of a Rectangle – Scale 1:100

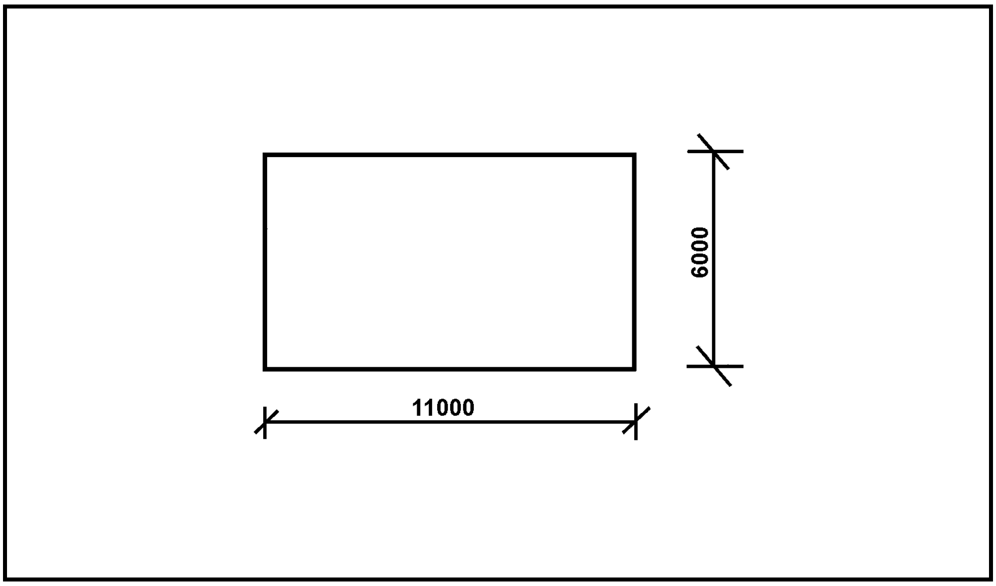


Figure 35: Plan of a Rectangle – Scale 1:200

SUMMARY

In this portion of Section 1 on orthographic projection you have gained an overview of the planes of projection and how the various views in a set of working drawings relate to these planes. You have also learnt about the use of the scale rule.

The knowledge you have thus far gained will better enable you to understand and extract information from a set of drawings.

In an off-site situation the plans will not be as detailed as those in this section. However, the skills and concepts used to interpret complex plans will be useful in your off-site factory.

The Self-Check Exercise 2 requires you to answer six questions relating to plans, orthographic drawing and information that would be found on a sectional detail.

In Self-Check Exercise 3 you are to answer questions relating to the scale rule and to complete a drawing exercise using the scale rule.

You may find it useful to make your own brief summary/notes below of the seven topics on orthographic projection and the use of scale rules.

Orthographic Projection

Planes of Projection

Line Types

Dimensions

Notes, lettering and abbreviations:

Sectional Views

Scales and the Scale Rule

SELF-CHECK

EXERCISE 2: PLAN INFORMATION

1. Why do plans have to be drawn and what information will they give?

   ____

   ____

   The information given should show:

   ____

   ____

   ____

   ____

   ____

2. In orthographic projection the plan view is drawn on the ____________ plane and elevations are drawn on the_______________ plane.

3. The term dimensions is a numerical note which _________________________ and is usually shown in _______________ except on site plans where the dimensions are mostly indicated in _____________________.

4. Name six items of information that would be shown on a section detail of a concrete footing and floor slab.

   (i) ________________________ (ii) ________________________

   (iii) ________________________ (iv) ________________________

   (v) ________________________ (vi) ________________________

SELF-CHECK

EXERCISE 3: PLAN DRAWING

1. A scale rule is essential for?

 ____

 ____

2. The scale rule should not be used as a guide for _________________________ lines.

3. Name at least four (4) things to be considered when selecting the scale for a particular drawing.

 (i) ____________________________ (ii) ____________________________

 (iii) ____________________________ (iv) ____________________________

4. On a sheet of A3 drawing paper. You are required to draw lines to the eight scales on your scale rule to an accuracy of ± 0.5mm.

 On the next page is an example of what you are required to do.

 Procedure:

 (i) Borderline

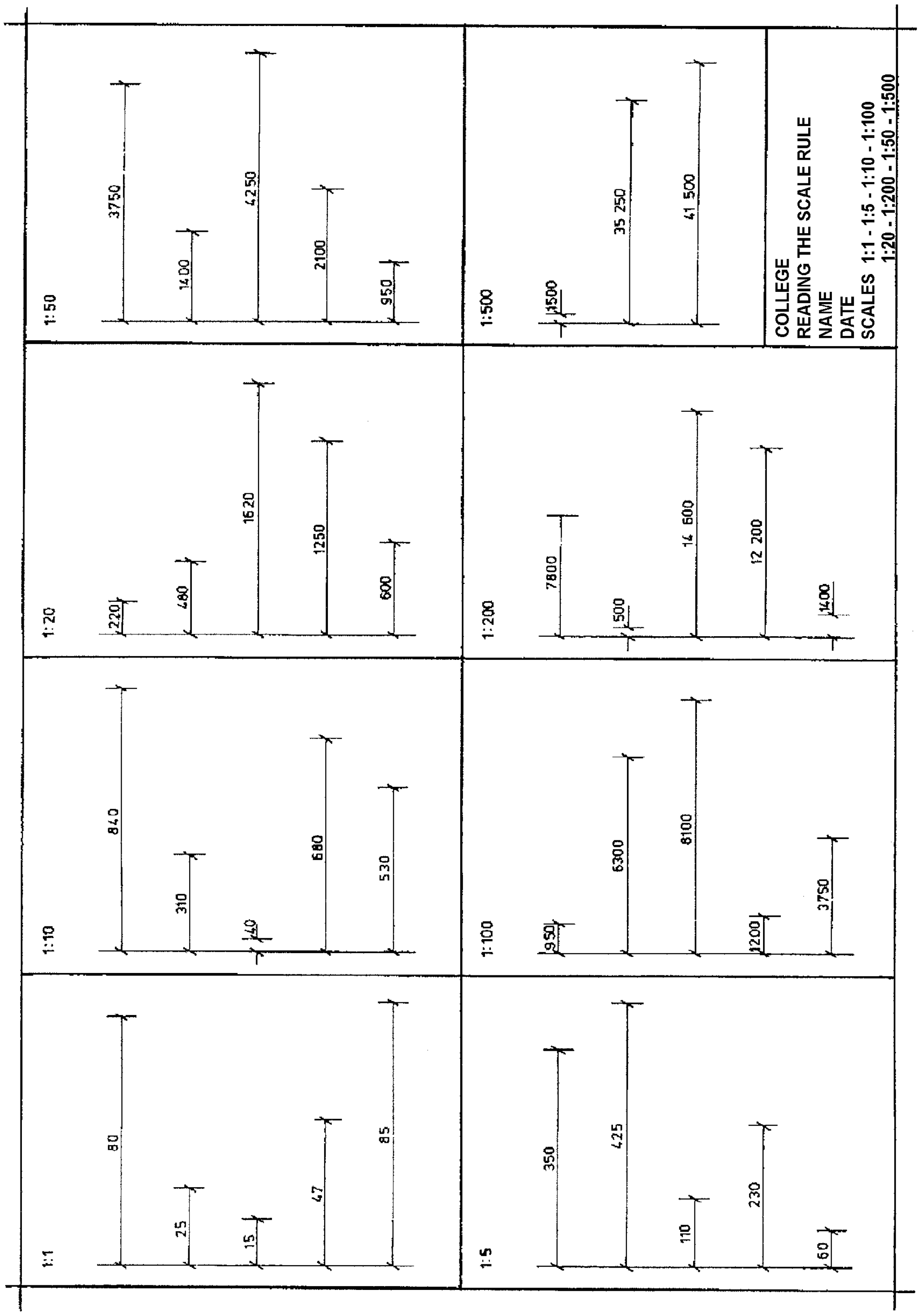
 (ii) Title block

 (iii) Divide the sheet into eight (8) equal rectangles

 (iv) At the top left hand corner of each rectangle nominate the scale used.

 (v) Draw a vertical line 10mm from the left hand side of each rectangle

 (vi) From the vertical line drawn in step (v) draw horizontal lines to the lengths and respective scales as shown in the example on next page


COLLEGE
READING THE SCALE RULE
NAME
DATE
SCALES 1:1 - 1:5 - 1:10 - 1:100
1:20 - 1:200 - 1:50 - 1:500
1:50
3750
1400
4250
2100
950
1:500
1500
35 250
41 500
1:20
220
480
1620
1250
600
1:200
7800
500
14 600
12 200
1400
1:10
840
310
140
680
530
1:100
950
6300
8100
1200
3750
1:1
80
25
15
47
85
1:5
350
425
110
230
60

PLAN AND DOCUMENT READING

Plans, drawings and specifications provide all the necessary information required by the builder to tender for and complete a construction project. They will also provide information for off site trades for the manufacture and fixing of internal fittings.

The Australian Standard, AS 1100 Part 301-1985, Architectural Drawing sets out details of those symbols, abbreviations, graphical representations etc. recommended for use on architectural drawings.

In the first portion of this section, SECTION 1, under the heading WORKING DRAWINGS you learnt about the various views/drawings that make a set of plans for a construction project.

This portion of Section 1 deals with:

- Title block.
- Drawing symbols.
- Fixture symbols.
- Electrical symbols.
- Abbreviations.
- Specifications.

18. TITLE BLOCK

The example of a title block shown on this page shows the relevant details found in the title block of most plans:

For example:

- Client
- Project
- Location
- Consultant
- Drawn by
- Checked by
- Issue or revision code
- Scale
- Date
- Project Number
- Drawing Number

<table>
<tr><td colspan="3">CLIENT:
D. C. Green and Company</td></tr>
<tr><td colspan="3">PROJECT:
Proposed Child Care Centre</td></tr>
<tr><td colspan="3">LOCATION
91 Fir Street
BARCALDINE QLD 4725</td></tr>
<tr><td colspan="3">PROJECT CONSULTANTS
Blake And Brown Consultants
Floor 3
125 Black Road
INDOOROOPILLY QLD 4068</td></tr>
<tr><td colspan="3">ARCHITECT
B. J. Smyth
7 Denham Street
INDOOROOPILLY QLD 4068</td></tr>
<tr><td colspan="3">THIS DRAWING
Elevations And Sections
DRAWN: B.C.
SCALE: 1:100
PROJECT NO:
BCA-721</td></tr>
<tr><td>DRAWN: B.C.</td><td>CHECKED: J.G.</td><td>ISSUE: A</td></tr>
<tr><td>SCALE: 1:100</td><td colspan="2">DATE: MAY 96</td></tr>
<tr><td>PROJECT No:
BCA-721</td><td colspan="2">DRAWING No:
WD - 04</td></tr>
</table>

Title Blocks are found usually in the
bottom right hand corner of the plan, and
can be vertical as shown here, or horizontal as shown below.

TYPICAL TITLE BLOCK

<table>
<tr><td rowspan="5">Other information relevant to the preparation of the drawings can be recorded here.</td><td colspan="2">CLIENT:</td><td colspan="4">D.C. Green and Company</td></tr>
<tr><td colspan="2">PROJECT:</td><td colspan="4">Proposed Child Care Centre</td></tr>
<tr><td colspan="2">LOCATION:</td><td colspan="4">91 Fir Street Barcaldine QLD 4725</td></tr>
<tr><td colspan="2">ARCHITECT:</td><td colspan="4">B.J. Smyth</td></tr>
<tr><td>Drawn
B.C.</td><td>Checked:
J.G.</td><td>Scale:
1:100</td><td>Project No:
BCA-721</td><td>Drawing No:
WD</td><td>Date:
10/96</td></tr>
</table>

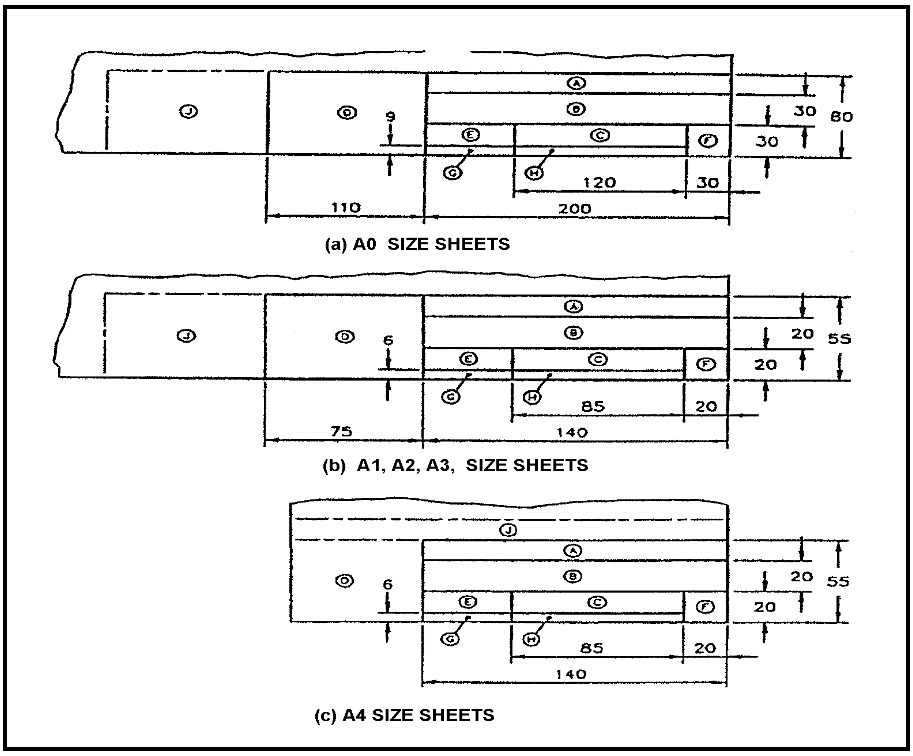


Figure 36: Suggested Size of a Title Block

Suggested Size of Title Block

LEGEND:

A The name of the company, organisation or design authority from which the drawing originates.

B The title or name of the drawing.

C The drawing number.

D A record of the information relative to the preparation of the drawing. This information could include the names of the draftsperson, checker and approving authority. It might also include a contractor's name and reference number.

E A code number identifying the particular division or department within the design authority responsible for the drawing.

F The drawing sheet size.

G The predominant scale of the drawing.

H This space, is reserved for miscellaneous information such as modification number, the sheet number for multi sheet drawings, or the estimated mass of the item.

I Additional blocks for other general information such as dimensions and tolerances notes, material notes, or surface finish requirements, should be placed in this area.

19. DRAWING SYMBOLS

Shown below are a series of symbols relating to the construction industry.

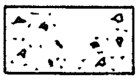
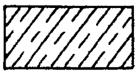
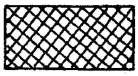
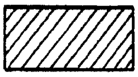
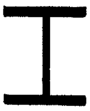
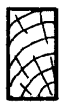
	**BRICKWORK** **Elev: Light Red** **Sect: Vermilion**	**EARTH** **Sepia**	
	**CEMENT RENDER** **Terra Verte**	**EARTH FILL** **Raw Umber**	
	**CONCRETE** **Hooker's Deep Green**	**ROCK** **Vandyke Brown**	
	**CUT STONE MASONRY** **Emerald Green**	**HARDCORE**	
	**PARTITION BLOCK** **Indian Red**	**INSULATION** **Cerulean Blue**	
	**CONCRETE BLOCK** **Green**	**GLASS** **Cobalt Blue**	
	**STRUCTURAL STEEL** **Prussian Blue**	**TIMBER** **Yellow Ochre**	
	**SANITARY FITTINGS** **French Ultra-marine**	**SAWN TIMBER** **Chrome Yellow**	
	**ROOF TILES** **Cadmium Red**	**DRESSED TIMBER** **Burnt Sienna**	

Figure 37: Drawing Symbols

20. FIXTURE SYMBOLS

Shown below are some symbols currently found on plans.

Common abbreviations are listed in *Figure 41*.

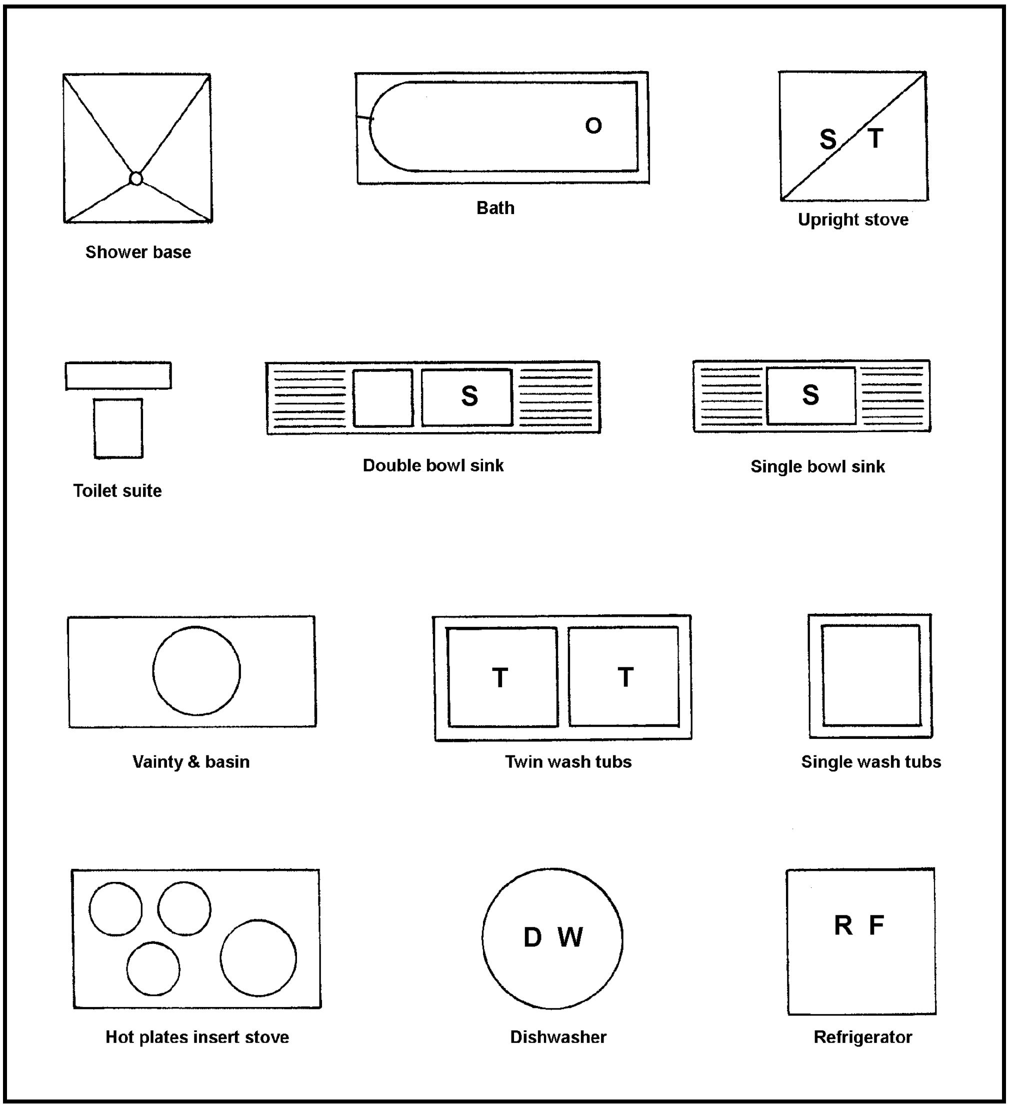


Figure 38: Fixture Symbols

21. ELECTRICAL SYMBOLS

Shown below are some symbols currently found on plans.

Common abbreviations are listed in *Figure 40*.

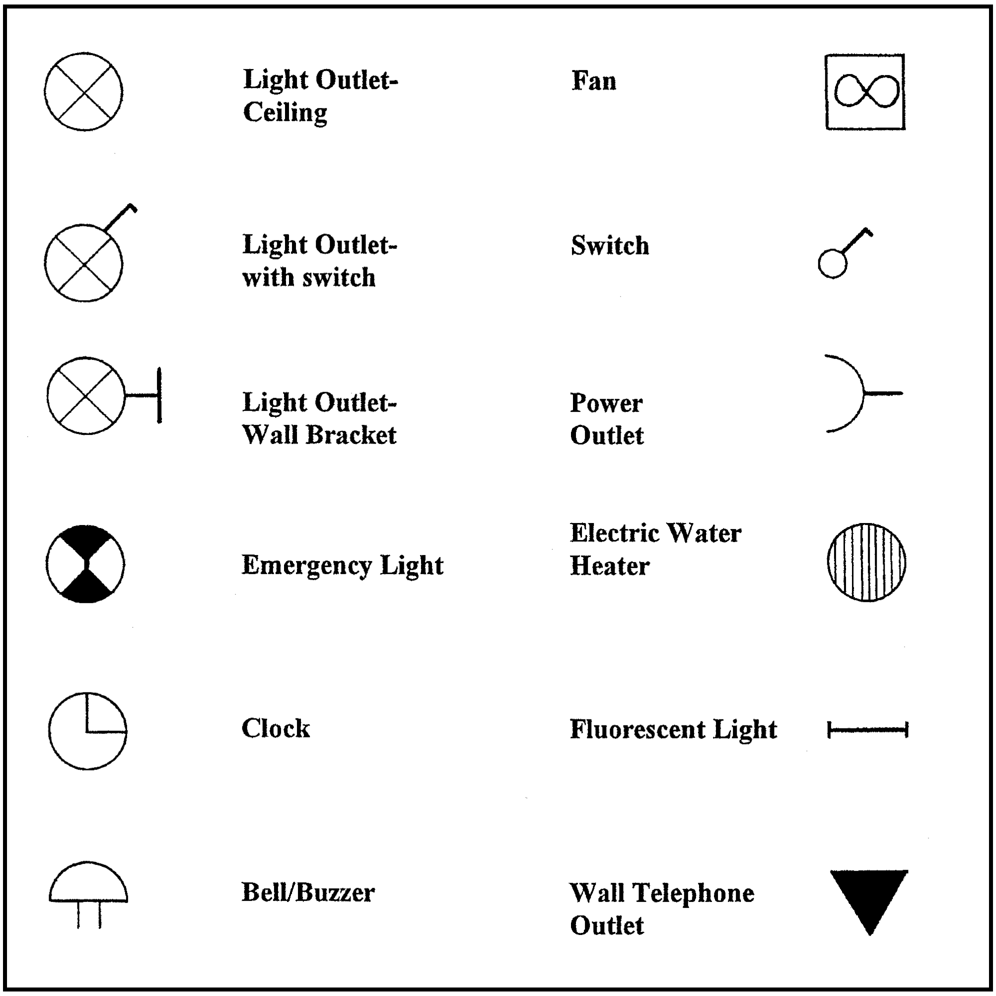


Figure 39: Electrical Symbols

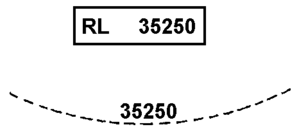
22. ABBREVIATIONS

Abbreviations are a quick method of writing on a plan without taking up too much space. They are also easy to read when used correctly. Have a close look at each abbreviation and you will see how the abbreviated letters are taken from their meanings

- Level Abbreviations

FCL: **Finished Ceiling Level**
FFL: **Finished Floor Level**
FGL: **Finished Ground Level**
NGL: **Natural Ground Level**
RL: **Reduced Level**

CONTOUR LINE



Listed below are some common abbreviations used in the construction industry.

Abbr'	Meaning	Abbr"	Meaning	Abbr"	Meaning
AL	**Aluminium**	**CONC**	**Concrete**	**R**	**Roof**
AS	**Australian Standard**	**CC**	**Concrete Ceiling**	**SD**	**Service Duct**
AUX	**Auxiliary**	**CF**	**Concrete Floor**	**SEW**	**Sewer**
B	**Basin**	**CTR**	**Contour**	**SD**	**Sewer Drain**
B	**Beam**	**CORR**	**Corrugated**	**SHR**	**shower**
BRR	**Bearer**	**DW**	**Dish Washer**	**S**	**Sink**
BLK	**Block**	**D**	**Door**	**SQ**	**Square Tube**
BDYL	**Boundary Line**	**DP**	**Down Pipe**	**SPR**	**Sprinkler**
BT	**Boundary Trap**	**DGE**	**Drainage**	**SF**	**Strip Footing**
BRKT	**Bracket**	**FHT**	**Floor Height**	**SWD**	**Storm Water Drain**
BK	**Brick**	**FW**	**Floor Waste**	**SWBD**	**Switchboard**
BV	**Brick Veneer**	**G**	**Gas**	**TC**	**Terra Cotta**
BWK	**Brick Work**	**HW**	**Hot Water Unit**	**TR**	**Trench**
BLDG	**Building**	**MH**	**Man Hole**	**TM**	**Trench Mesh**
BL	**Building Line**	**OUT**	**Outlet**	**TRH**	**Trough**
CBL	**Cable**	**OA**	**Overall**	**T**	**Truss**
CAB	**Cabinet**	**OH**	**Overhead**	**U/C**	**Under Construction**
CAN	**Canopy**	**PF**	**Pad Footing**	**U/G**	**Underground**
CI	**Cast Iron**	**PTN**	**Partition**	**UB**	**Universal Beam**
CW	**Cavity Wall**	**P**	**Pier**	**UR**	**Urinal**
CEM	**Cement**	**P/F**	**Plan of Sub-division**	**V**	**Vent**
CM	**Cement Mortar**	**PBD**	**Plasterboard**	**VER**	**Verandah**
CR	**Cement Render**	**PG**	**Plate Glass**	**VERT**	**Vertical**
CRS	**Centres**	**PF**	**Portal Frame**	**WBD**	**Wallboard**
CL	**Centre line**	**PCC**	**Precast Concrete**	**WP**	**Waste Pipe**
CHY	**Chimney**	**RAD**	**Radius**	**WC**	**Water Closet**
CCT	**Circuit**	**RF**	**Raft Footing**	**WPM**	**Waterproof M'brane**
CD	**Clothes Drier**	**RHT**	**Rail Height**	**WM**	**Water Meter**
CW	**Cold Water**	**RWH**	**Rain Water Head**	**WR**	**Weather Resistant**
COL	**Column**	**RSC**	**Rolled Steel Channel**	**WRC**	**Western Red Cedar**
C	**Cooker**	**RSJ**	**Rolled Steel Joist**	**W**	**Window**

Figure 1 Abbreviations Used By The Construction Industry

23. SPECIFICATION

The specification forms part of the Tender Documents and ultimately part of the Contract Documents.

The Australian National Building Specifications Systems (NATSPEC) is designed as a guide specification for building works.

Most house building is performed using a standard Home Building Specification prepared by the Housing Industry Association or the Master Builders Association of the respective State.

These specification documents contain a general building specification, along with an accompanying Schedule or Supplement compiled to cater for the needs and requirements of the individual proprietors for their specific house. Items such as the following are spelt out in detail:

- disposal of excavated materials
- trees and other items to be protected
- extent of drainage work
- extent and finish to concrete
- type and colour of bricks
- type of floor sheeting, internal linings and ceilings
- manufacture and type of door and window frames and sashes
- external and internal joinery designs, door hardware and furniture
- sizes and details of internal fixing timbers
- glazing types
- extent of cupboards and wardrobes etc
- roof sheeting material and sarking/sisalation
- make and type of plumbing fixtures and fittings
- extent of electrical work and type of switches and fittings throughout
- extent of, type and quality of wall and floor tiling
- other floor covering and finishes
- painting and colour selection
- Prime Cost Items (P.C.I.s)
- items to be supplied by the proprietor
- details of other miscellaneous items to be supplied by the builder or the proprietor.

This list is a cross section only. It includes the type of information expected to be detailed in a schedule or supplement to a standard builders/proprietors specification document and is not a comprehensive listing. A current HIA or MBA specification complete with schedule and/or supplement should be accessed by each learner for inspection and perusal. Copies of these documents should be available in the library or from your instructor.

SUMMARY

This portion of Section 1 on Title Blocks, Symbols, Abbreviations and Specifications has provided you with basic information on each of these areas. When combined with the knowledge gained by you from studying the previous two portions of this section, this will enable you to interpret more accurately further information from a set of working diagram.

The symbols and abbreviations used in plans are usually the same whether you are working on a large construction site or a small factory. If you are in an off-site construction situation the plans and specifications you use may be quite simple and some may not require many symbols and abbreviations.

The Self-Check Exercises No 4 and 5 requires you to read and interpret information from a set of working drawings for the construction of a dwelling as well as identification of abbreviations and symbols used on drawings.

You may find it useful to make your own brief summary/notes below on the six topics.

Title Block

Drawing Symbols

Fixture Symbols

Electrical Symbols

Abbreviations

Specifications

SELF-CHECK

EXERCISE 4: DOCUMENT INFORMATION

1. Explain the term "Title Block"

____
____
____
____
____
____
____

- ____________________ • ____________________
- ____________________ • ____________________
- ____________________ • ____________________
- ____________________ • ____________________
- ____________________ • ____________________

2. Name what each of the following abbreviations stands for:

BK. ____

BL. ____

CW. ____

FHT. ____

HW. ____

PG. ____

CW. ____________________

SEW. ____________________

UB. ____________________

WC. ____________________

SQ. ____________________

COL. ____________________

SHR. ____________________

CF. ____________________

3. Sketch in the appropriate material symbol in the rectangles below.

Sawn Timber	**Insulation**
Earth	**Structural Steel**
Dressed Timber	**Partition Block**
Glass	**Brickwork**

4. Neatly sketch the relevant electrical symbol in the space provided.

Meaning	Symbol	Meaning	Symbol
Emergency Light		Fluorescent Light	
Ceiling Light		Power Outlet	
Electric Water Heater		Switch	

5. Clearly print the appropriate abbreviations in the relevant spaces provided.

Meaning	Abbreviation	Meaning	Abbreviation
Door		Basin	
Western Red Cedar		Trench Mesh	
Brick Veneer		Roof	
Window		Centre Line	
Stormwater Drain		Floor Waste	
Australian Standards		Hot Water Unit	
Down Pipe		Building Line	
Building		Switchboard	
Strip Footings		Concrete	
Plasterboard		Partition	
Finished Ceiling Level		Universal Beam	
Cabinet		Finished Floor Level	
Wallboard		Rain Water Head	

SELF-CHECK

EXERCISE 5: PLAN READING

From the plans, elevations and details shown on *Figures 1-5* or from a set of plans supplied by your instructor carry out the following plan reading exercise.

No.	Statement	View/s Where Answer Found
1	Roof overhang outside the laundry is ____________	
2	Size of building block measures __________ x ___________	
3	There are _____ internal doors ______ and external doors	
4	The distance from southern boundary to the wall of the building is _________________________________	
5	The proposed building is to be built at ____	
6	Overall width of the building measures ___________	
7	There are ______________________ rainwater down pipes	
8	Roof covering to the building is _________________	
9	Reinforced concrete footings to external walls measure _______________________ x _________________________	
10	Floor finishes to laundry, WC and bathroom are ________	
11	Main roof slope is ____________________________	
12	Set back from street alignment to the building measures _____________________________________	

No.	Statement	View/s Where Answer Found
13	Minimum height from finished floor level to ceiling level is ____	
14	Windows to the front of the building are ____ (opening action)	
15	Window 2 measures ___________________ high by ____________________ wide	
16	Overhang to roof measures _________________ and is taken from to ______________________ to _________________________.	
17	Internal measurements of linen cupboard are ____ x ____	
18	Width of verandah is ___________________________	
19	Roof slope to the verandah is ___________________	

Questions 20 to 38 are multiple choice, you are to place a adjacent to the answer of your choice.

No.	Statement		View/s Where Answer Found
20	Windows to bedroom 2 and 3 are:		
	a) Fixed Glass	b) Vertical sliding	
	c) Horizontal sliding	d) Casement	
21	Laundry door type is:		
	a) Ledged and braced	b) Flush door	
	c) Half glazed	d) Ext. Flush Panel	
22	Reinforcement to concrete footing is:		
	a) F.62 mesh	b) Not shown	
	c) F8TM	d) 10mm M.S. rod	
23	Roof covering is:		
	a) Terra-cotta tiles	b) Concrete tiles	
	c) Super six FC sheeting	d) Corr. Colourbond	
24	Distance from Eastern boundary to building line is:		
	a) 10 900	b) 11 200	
	c) Not Shown	d) 4200	
25	Timber roof trusses are spaced at		
	a) 600c to c	b) 1200c to c	
	c) 450c to c	d) 900c to c	
26	Window 7 is shown as being:		
	a) 2400 high	b) 1200 high	
	c) 900 high	d) 600 high	

No.	Statement		View/s Where Answer Found
27	Laundry window is:		
	a) 1300 above F.L.	b) 1200 above F.L.	
	c) 1000 above F.L.	d) 900 above F.L.	
28	Bathroom size is:		
	a) 1800 x 1800	b) 1800 x 1200	
	c) 1800 x 2980	d) 3000 x 2000	
29	Overall depth of the building is:		
	a) 8700	b) 15 030	
	c) 10 800	d) 17 130	
30	Door 1 is shown as being:		
	a) 2100 wide	b) 1200 wide	
	c) 2700 wide	d) 900 wide	
31	Kitchen sink is shown on the:		
	a) North wall	b) West wall	
	c) East wall	d) South wall	
32	Main floor level above ground level is:		
	a) 425 max.	b) 225 max.	
	c) 225 min.	d) 425 min.	
33	Bracing panel 7 is in the partition wall between:		
	a) Bed 1 and lounge	b) Kitchen and Bathroom	
	c) Bed 1 and Bed 2	d) Lounge and Dining	

No.	**Statement**		**View/s Where Answer Found**
34	The length of bracing panel 6 is:		
	a) 2.1m	b) 2.4m	
	c) 2.7m	d) 1.8m	
35	Roof battens are:		
	a) 75 x 50 Rhw	b) 75 x 38 Rhw	
	c) 50 x 50 Rhw	d) 50 x 25 Rhw	
36	Tie-down bolts to the external wall are:		
	a) M10 at 1200c/s	b) M12 at 900c/s	
	c) M12 at 1200c/s	d) M10 at 900c/s	
37	Concrete bases to verandah posts are:		
	a) 350 x 350 x 750	b) 750 x 750 x 350	
	c) 350 x 450 x 750	d) 450 x 450 x 600	

DEMONSTRATION

Your instructor will demonstrate the procedure for drawing sectional details and determine the extent of the practice you require before you begin the practical sketching/drawing activity. One of the examples may form part of the practical activity.

Example 1

Neatly sketch, at an approximate scale of 1:20, an elevation of that part of a timber framed wall showing a window opening and one common stud each side of the opening.

Specification:

• Ceiling height	2400
• Joinery line	2100
• Window	1200 H x 1500W Sliding Aluminium
• Bottom Wall plate	70 x 35
• Top Wall plate	70 x 45
• Common Studs	70 x 35 at 450c/s
• Opening Studs	70 x 35 two to each side of opening
• Lintel	190 x 45
• Nogging	70 x 35
• Sill trimmer	70 x 35
• Hold down bolts	12 ∅

You are to show and indicate the following members on your sketch

- Bottom and top wall plates
- Common studs
- Jamb studs
- Secondary jamb studs
- Lintel
- Sill trimmer
- Jack studs
- Nogging
- Hold down bolts
- Framing anchors or tie down straps from opening studs to top and bottom plates.

Example 2

Neatly sketch, at an approximate scale of 1:10, a vertical section through a concrete strip footing and concrete floor slab junction to show the following:

• Concrete footing	500 deep x 450 wide
• Reinforcement to footing	2 layers F8TM 4 bars wide
• Ligatures/stirrups	300 x 300 x 6 ∅
• Concrete cover to rein.	65 to bottom of trench
• Top of footing	50 below G.L.
• Concrete slab to G.L.	250
• Concrete slab the top of footing	100 thick with external thickening down to
• Reinforcement to slab	F62 with 30 concrete cover from top of slab
• Lower portion of brick veneer wall	(5 bricks high)
• Lower portion of timber framed wall	
• Bottom wall plate	90 x 35
• Studs	90 x 35
• Polythene membrane under concrete slab	
• D.P.C under timber bottom wall plate	
• Flashing to wall cavity	
• Weep holes in brick veneer wall	
• Hold down bolt	200 plus 50 offset in concrete by 12 ∅

Example 3

Neatly sketch, at an approximate scale of 1:10, a horizontal section through one side of an internal door opening showing the following members:

• Door stud	70 x 35
• Bottom Wall plate	70 x 35
• Jamb lining	92 x 19 Dr. Pine
• Wall sheeting	10 thick plasterboard
• Architrave	42 x 12 Dr. P. Bullnosed
• Skirting	66 x 12 Dr. P. Bullnosed
• Door Steps	32 x 12 Dr. P.
• Door	2040 x 820 x 35 Flush Panel

Neatly sketch, at an approximate scale of 1:10, an elevation and horizontal section through a brick pier on a concrete pad footing. Show a tie down rod centrally positioned in the concrete filled hollow core.

Specification:

• Brick	230 x 110 x 76 with 10 mortar joints
• Brick pier	350 x 350 with concrete filled hollow core
• Concrete pad footing	500 x 500 x 250 thick
• Tie down rod	12 ∅
• Footing	600 below G.L.
• Top of pier	600 above GL.

In an off-site construction workplace most job instructions are recorded on job sheets. Sometimes job specifications will detail the job requirements when producing such things as pre-fabricated housing and relocatable dwellings.

Different workplaces use different methods for detailing job instructions. Sometimes, just a request from another worker for help can be a type of job instruction.

Whatever form the job instructions come in, you should follow them exactly. They have been given with the following things in mind:

- design of the product
- safety precautions
- workplace procedures
- other operations in your workplace.

EXERCISE 6: JOB INSTRUCTIONS

1. How are job instructions written in your workplace?

2. Are job instructions ever conveyed by word of mouth? In what circumstances?

3. How do your job instructions guide you in your work?

DEMONSTRATION

Your trainer will show some examples of job instructions and/or job specification s from your workplace.

PRACTICAL ACTIVITY

Assessment Task 1 of this module is covered in this section in this book.

The National Competency Standards related to this section requires you to record and interpret basic information from plans and specifications. The main elements of which are to:

- Identify types of plans and their functions.
- Recognise commonly used symbols and abbreviations.
- Locate and identify key features on a site plan.

ACTIVITY 1: PLAN READING

Your instructor will provide you with a set of working drawings and specifications, for example a set of house plans.

(a) Under the directions of your instructor you are required to identify six (6) different views that make up a set of plans and state the main function of, or the main information that can be interpreted from each of the views nominated.

(b) You are to read from these plans twenty (20) items of information. Your instructor will nominate the items you are required to find and record (They will be similar to those listed in Exercise 5).

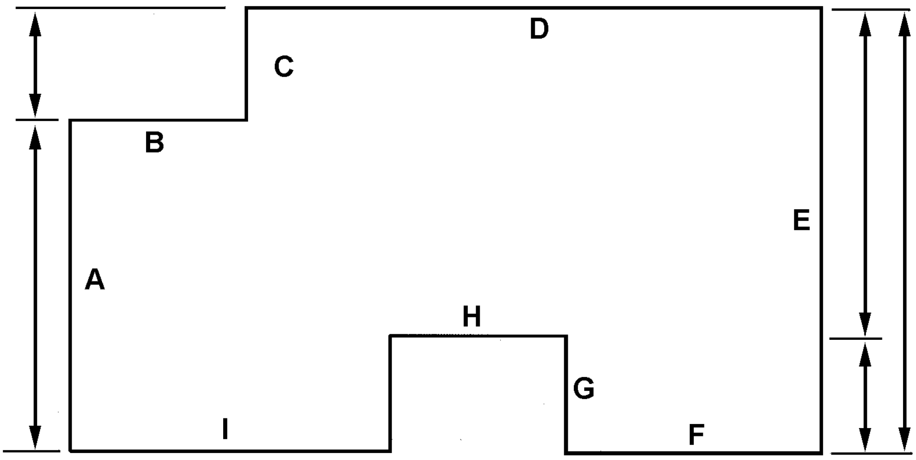
(c) Your instructor will nominate five (5) items you are required to find and interpret from the specification provided.

(d) Accurately sketch, to an approximate given scale, a sectional detail nominated by your instructor. Refer to the examples listed earlier under the heading; or

(e) On the single line house plan shown below, or on a plan provided by your instructor you are to complete the dimensions of all sides including the overall dimensions and the dimensions of sides C and H.

Dimensions

A.	5800	F.	3600
B.	2400	G.	2100
C.		H.	
D.	9000	I.	4800
E.	7500		



ACTIVITY 2

Some of the plans used in your workplace will not be as detailed as those described in the last section.

In your workplace gather together examples of job instructions. Carefully check these job instructions you may have with your trainer.

CONCLUSION

This learning package has combined the theoretical and practical components required for the competency unit **BCG1003 – Read and Interpret Plans.**

Having successfully completed the requirements of this competency unit you now understand the procedures for reading and interpreting information from plans and specifications and performing calculations involving lineal measure, areas of regular and irregular shapes, volume, costing and percentage allowance for waste and overheads. In addition, you have applied the knowledge and skills in a number of real life situations.

Although this module may have gone into too much detail if you do not construct houses many of the issues will apply to your workplace the tasks you have to perform.

You can expect to apply your knowledge and skills again and again on a range of construction sites.

The developers of this package hope that you have found its style and presentation easy to use.

SELF-CHECK **ANSWERS**

EXERCISE 1: WORKING DRAWING

1. An approved plan or working drawing is required to enable **estimators, builders and sub-contractor tradespersons to carry out their respective tasks.**

2. State the names given to each part or view of a set of plans for the construction of a house.

(i)	**site plan**	(ii)	**section details**
(iii)	**foundation plan**	(iv)	**sectional elevation**
(v)	**floor plan**	(vi)	**bracing plan**
(vii)	**elevations (4)**	(viii)	**joinery schedule**

3. The position of a building on an allotment is indicated on the **site plan.**

4. The information found on floor plans includes:

   (i) overall shape

   (ii) dimensions of individual rooms, patios etc

   (iii) thickness of walls

   (iv) position of openings, windows and doors

   (v) roof outline

5. Elevations are identified according to the **direction they face - NORTH, SOUTH, EAST OR WEST**.

6. Three items of information that is shown on or adjacent to elevations are:

   (i) external cladding

   (ii) roof slope and overhang

   (iii) windows and doors to external walls

7. Section details are usually drawn to a larger scale eg 1:10 because it is not practical to show **specific construction details** on small scale drawings.

8. Some of the information that can be obtained from a full sectional elevation is:

   (i) floor height above ground level

   (ii) ceiling height

   (iii) joinery line/height

   (iv) handrail height if applicable

   (v) depth of footings

9. Bracing plans are single line floor plans that indicate the **type, length and position of bracing panels.**

10. The information given in a joinery schedule is:

   (i) type of window or door.
   (ii) size of window or door
   (iii) material use in their construction
   (iv) position they occupy in the building

SELF-CHECK **ANSWERS**

EXERCISE 2: PLAN INFORMATION

1. Why do plans have to be drawn and what information will they give?

   To accurately describe a particular building to all interested parties before it is constructed.

   The information given should show:

   Location and size of the spaces in a building.

   Materials to be used.

   Location of the building on the site.

   Special fittings and finishes.

   Layout of services.

2. In orthographic projection the plan view is drawn on the **horizontal** plane and elevations are drawn on the **vertical** plane.

3. The term dimension is a numerical note which **describes the size of a building on a drawing** and is usually shown in **millimetres (mm)** except on site plans where the dimensions are mostly indicated in **metres (m)** to **two (2) decimal places.**

4. Name six items of information that would be shown on a section detail of a concrete footing and floor slab.

(i)	**size of footing**	(ii)	**damp proof course (D.P.C.)**
(iii)	**size and position of reinforcement**	(iv)	**polythene membrane**
(v)	**flashing**	(vi)	**weep holes**

SELF-CHECK **ANSWERS**

EXERCISE 3: PLAN DRAWING

1. A scale rule is essential for?

   Trade drawing

2. The scale rule should not be used as a guide for **drawing** lines.

3. Name at least four (4) things to be considered when selecting the scale for a particular drawing. Choice of six (6).

   (i) **The type of information to be communicated.**

   (ii) **The need for the drawing to adequately and accurately communicate the information necessary for the particular work to be carried out.**

   (iii) **The need for economy of time and effort in drawing.**

   (iv) **Requirements for building or lending authorities.**

   (v) **Complexity of item being drawn.**

   (vi) **Size of drawing sheet adopted.**

4. On a sheet of A3 drawing paper you are required to draw lines to the eight (8) scales on your scale rule to an accuracy of 0.5mm.

   To be checked by your instructor.

SELF-CHECK **ANSWERS**

EXERCISE 4: DOCUMENT INFORMATION

1. Explain the term "title block".

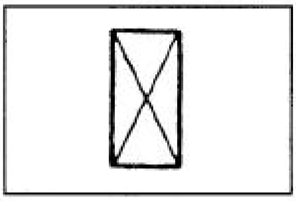
The title block is usually situated at the bottom right hand corner of a drawing sheet and indicates the following:

- **Client**
- **Project**
- **Location (address)**
- **Consultant**
- **Drawn by**
- **Checked by**
- **Issue or revision code**
- **Scales**
- **Date drawn**
- **Project number**
- **Drawing number**

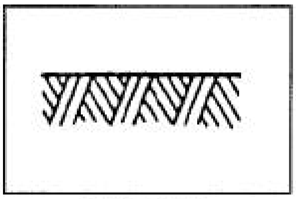
2. Name what each of the following abbreviations stands for:

BK	**Brick**
BL	**Boundary Line**
CW	**Cavity Wall**
FHT	**Floor Height**
HW	**Hot Water Unit**
PG	**Plate Glass**
SEW	**Sewer**
UB	**Universal Beam**
WC	**Water Closet**
SQ	**Square Tube**
COL	**Column**
SHR	**Shower**
CF	**Concrete Floor**

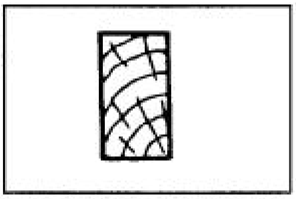
3. Sketch in the appropriate material symbol in the rectangles below.



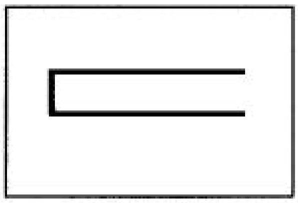
SAWN TIMBER



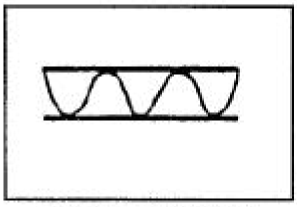
EARTH



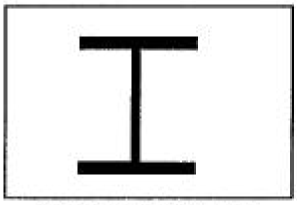
DRESSED TIMBER



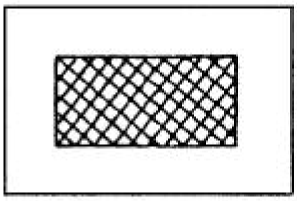
GLASS



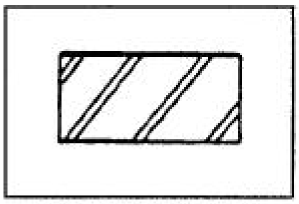
INSULATION



STRUCTURAL STEEL

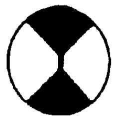
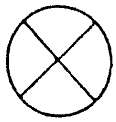
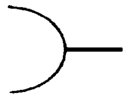
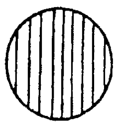


PARTITION BLOCK



BRICKWORK

4. Neatly sketch the relevant electrical symbol in the space provided.

Meaning	Symbol	Meaning	Symbol
Emergency Light		Fluorescent Light	
Ceiling Light		Power Outlet	
Electric Water Heater		Switch	

5. Clearly print the appropriate abbreviation in the relevant space provided.

Meaning	Abbreviation	Meaning	Abbreviation
Door	**D**	Basin	**B**
Western Red Cedar	**WRC**	Trench Mesh	**TM**
Brick Veneer	**BV**	Roof	**R**
Window	**W**	Centre Line	**CL or L**
Stormwater Drain	**SWD**	Floor Waste	**FW**
Australian Standards	**AS**	Hot Water Unit	**HW**
Down Pipe	**DP**	Building Line	**BL**
Building	**BLDG**	Switchboard	**SWBD**
Strip Footings	**SF**	Concrete	**CONC**
Plasterboard	**PBD**	Partition	**PTN**
Finished Ceiling Level	**FCL**	Universal Beam	**UB**
Cabinet	**CAB**	Finished Floor Level	**FFL**
Wallboard	**WBD**	Rain Water Head	**RWH**

SELF-CHECK **ANSWERS**

EXERCISE 5: PLAN READING

From the plans, elevation and details shown on *Figures 1 to 5* or from a set of plans supplied by your instructor carry out the following plan reading exercise.

No.	Statement	View/s Where Answer Found
1	Roof overhang outside the laundry is **600**	**West Elevation**
2	Size of building block measures **34.479** x **20.00**	**Site Plan**
3	There are **6** internal doors **3** and external doors	**Floor Plan**
4	The distance from southern boundary to the wall of the building is **3.2**	**Site Plan**
5	The proposed building is to be built at **Lot 445 Greenup St., Waridale Park, Capalaba**	**Site Plan**
6	Overall width of the building measures **10,800**	**Floor Plan**
7	There are **4** rainwater down pipes	**Site Plan**
8	Roof covering to the building is **Corr.Colourbond**	**South Elevation**
9	Reinforced concrete footings to external walls measure **450** x **300**	**Detail of Footing**
10	Floor finishes to laundry, WC and bathroom are **tiles**	**Floor Plan**
11	Main roof slope is **20 E**	**East Elevation**
12	Set back from street alignment to the building measures **6.00**	**Site Plan**
13	Minimum height from finished floor level to ceiling level is **2400**	**Section A-A**
14	Windows to the front of the building are **1200 x 1200 Aluminium Sliding** (opening action)	**Floor Plan and Joinery Schedule**

No.	Statement		View/s Where Answer Found
15	Window 2 measures **1200** high by **1500** wide		**Joinery Schedule**
16	Overhang to roof measures **600** and is taken from to **outside brickwork** to **outside fascia**		**West or North Elevations**
17	Internal measurements of linen cupboard are **600** x **2000**		**Floor Plan**
18	Width of verandah is **2100**		**Floor Plan**
19	Roof slope to the verandah is **10**		**East Elevation**
20	Windows to bedroom 2 and 3 are:		**Floor Plan and Joinery Schedule**
	a) Fixed Glass	b) Vertical sliding	
	c) Horizontal sliding	d) Casement	
21	Laundry door type is:		**Floor Plan and Joinery Schedule**
	a) Ledged and braced	b) Flush door	
	c) Half glazed	**d) Ext. Flush Panel**	
22	Reinforcement to concrete footing is:		**Detail of Floor Slab and Footing**
	a) F.62 mesh	b) Not shown	
	c) F8TM	d) 10mm M.S. rod	
23	Roof covering is:		**South Elevation**
	a) Terra-cotta tiles	b) Concrete tiles	
	c) Super six FC sheeting	**d) Corr. Colourbond**	
24	Distance from Eastern boundary to building line is:		**Site Plan**
	a) 10 900	b) 11 200	
	c) Not Shown	d) 4200	
25	Timber roof trusses are spaced at		**Section A-A**
	a) 600c to c	b) 1200c to c	
	c) 450c to c	**d) 900c to c**	

No.	Statement		View/s Where Answer Found
26	Window 7 is shown as being:		**Joinery Schedule**
	a) 2400 high	b) 1200 high	
	c) 900 high	**d) 600 high**	
27	Laundry window is:		**Floor Plan and Joinery Schedule**
	a) 1300 above F.L.	**b) 1200 above F.L.**	
	c) 1000 above F.L.	d) 900 above F.L.	
28	Bathroom size is:		**Floor Plan**
	a) 1800 x 1800	**b) 1800 x 1200**	
	c) 1800 x 2980	d) 3000 x 2000	
29	Overall depth of the building is:		**Floor Plan**
	a) 8700	b) 15 030	
	c) 10 800	d) 17 130	
30	Door 1 is shown as being:		**Floor Plan and Joinery Schedule**
	a) 2100 wide	b) 1200 wide	
	c) 2700 wide	d) 900 wide	
31	Kitchen sink is shown on the:		**Floor Plan and Joinery Schedule**
	a) North wall	b) West wall	
	c) East wall	d) South wall	
32	Main floor level above ground level is:		**Detail of Floor Slab and Footing or Section A-A**
	a) 425 max.	b) 225 max.	
	c) 225 min.	d) 425 min.	
33	Bracing panel 7 is in the partition wall between:		**Floor Plan and Bracing Plan**
	a) Bed 1 and lounge	b) Kitchen and Bathroom	
	c) Bed 1 and Bed 2	d) Lounge and Dining	

No.	Statement		View/s Where Answer Found
34	The length of bracing panel 6 is:		**Bracing Details**
	a) 2.1m	b) 2.4m	
	c) 2.7m	d) 1.8m	
35	Roof battens are:		**Timber Framing List**
	a) 75 x 50 Rhw	**b) 75 x 38 Rhw**	
	c) 50 x 50 Rhw	d) 50 x 25 Rhw	
36	Tie-down bolts to the external wall are:		**Detail of Floor Slab and Footing**
	a) M10 at 1200c/s	b) M12 at 900c/s	
	c) M12 at 1200c/s	d) M10 at 900c/s	
37	Concrete bases to verandah posts are:		**Detail of and Verandah Post Plate**
	a) 350 x 350 x 750	b) 750 x 750 x 350	
	c) 350 x 450 x 750	d) 450 x 450 x 600	

RECORD OF COMPETENCY

Competency BCG1003A – Read and Interpret Plans

TRAINEE DETAILS

Trainee Name: ....

Address: ....

.... **Postcode:** ....

Date Commenced: .... **Registration No:** ....

Employer: ....

Address: ....

.... **Postcode:** ....

Trainee Signature: ....

Date: ....

ON THE JOB ASSESSMENT SHEETS

Instructions for Completing Assessment Sheets

These *Assessment Sheets* help the assessment of competence against the nationally endorsed construction industry standards.

The *Assessment Conditions* explain the level of skill and responsibility required in performance and also the range of work to be included in the task being assessed.

The level of skill and responsibility of performance includes the following.

Work undertaken in a team situation	Application of knowledge in the performance of this task, while working under routine supervision assisting team members.
Work undertaken with limited supervision only	Application of in-depth knowledge in the performance of this task, while working under limited supervision.

The *Performance Criteria* will help you make a valid, fair and reliable assessment of competency on-the-job.

The Assessment Sheets should be completed in consultation with employers and other staff involved in this training. Assessments should be done on a progressive basis.

As you make your self assessments the following questions apply.

1. Have the necessary technical knowledge and skills for the task being assessed?
2. Perform the related tasks in accordance with the Assessment Conditions and the Performance Criteria?
3. Apply their knowledge and skills for this competency **in a number of different job situations.**

UNIT OF COMPETENCY

Competency BCG1003A – Read and Interpret Plans

The trainee consistently performs as follows:

Identify Types of Drawings and Their Functions	❑
Recognise Commonly Used Symbols and Abbreviations	❑
Locate and Identify Key Features on a Site Plan	❑
Identify and Locate Key Features from Sectional Details and Elevations	❑
Recognise Amendments	❑
Read and Interpret Specifications	❑

CERTIFICATION

BCG1003A – Read and Interpret Plans

The Trainee has achieved competence in BCG1003A.

R.T.O: ....

Signature: .... **Date:** ....

AMENDMENT RECORD

The following table is designed to register officially endorsed amendments to this resource package document.

Accurate record keeping of such amendments enhances the currency of materials contained in resource package that form the total qualification or competency standard.

AMENDMENT RECORD SHEET				
AMENDMENT NUMBER	**AMENDMENT PAGE NUMBER**	**DATE OF AMENDMENT**	**AMENDMENT BY WHOM**	**COMMENT**

